

Volume 2
Issue 7

June
1989

Price £1.20

RISC USER



32,000 Colours

THE MAGAZINE AND SUPPORT GROUP
EXCLUSIVELY FOR USERS OF THE ARCHIMEDES

RISC USER

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RISC User is published by BEEBUG Ltd.

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The Archimedes Magazine and Support Group.

EDITORIAL

ACORN LAUNCH NEW ARCHIMEDES

As forecast in RISC User, Acorn has now released details of a new Archimedes compatible system, the A3000, and we bring you the first hard facts about the new machine in this issue. The A3000 returns to the 'one box' style of the Master 128, and also becomes the latest 'BBC Microcomputer'.

It is always good to see the company whose computers we support, actively promoting new systems. At this early stage in its life we wish it a successful future.

READER SURVEY

The centre pages of this issue of RISC User take the form of a reader survey. We want to ensure that RISC User continues to satisfy the needs of Archimedes owners in the best possible way, and your views are vitally important in determining the future direction and format of the magazine. The centre pages have not been numbered so that removing them from the magazine will leave the rest of the magazine intact.

We urge you to complete the questionnaire and return it to us as soon as possible, and in any case not later than 9th June 1989.

We very much hope that you will use this opportunity to tell us the kind of magazine you want RISC User to be. But do remember that not everybody will necessarily have the same views as yourself. When we analyse the results we will try to take all viewpoints into account.

NEW BEEBUG PRODUCTS FOR THE ARCHIMEDES

Readers may be interested to know that BEEBUG is working on a major word processing/desktop publishing package for the Archimedes, and will be demonstrating this for the first time at the BBC Acorn User Show in July. Also available soon will be a handheld 200 dots per inch scanner for under £200.

NOTE: The next issue of RISC User is our two-month summer issue for July/August, and this will be sent out in the first half of July.

*This month's telesoftware password is **dandelion**.
(See BEEBUG pages on Micronet)*

NewsNewsNewsNewsNew

TURBO ARM

Cambridge based Aleph One Ltd. are developing a plug-in board that allows Acorn's new ARM-3 RISC processor to be fitted to a standard Archimedes. The ARM-3 is fully compatible with the existing ARM processor, but can run at a clock speed of 24MHz as opposed to the 8MHz used in existing Archimedes. The main feature of the ARM-3 is a 4K on-chip instruction cache which allows the most recently used instructions to be stored in very fast memory, greatly reducing the execution time of program loops. Aleph One say that this increases the Archimedes speed by a factor of, on average, two to three, and as much as five on certain operations (particularly graphics intensive programs). The ARM-3 upgrade board is expected to sell for around £595, which will include an enhanced version of the floating point emulator, and a RISC OS utility which will allow the system to be switched back to the standard Archimedes speed. The release date of the upgrade is not yet known due to the small supply of ARM-3 chips currently available, but for more details contact Aleph One Ltd., The Old Courthouse, Bottisham, Cambridge CB5 9BA, tel. (0223) 811679.

PAL ENCODERS

For budding movie moguls the *Datavid-Arc* PAL encoder from Interactive Media Resources is a must. The unit takes the RGB monitor output from the Archimedes and encodes it into the PAL (Phase Alternative by Line) format needed for composite video systems. The resulting output can be recorded on any video recorder (for example a home VHS system or a professional U-Matic device), or displayed on any monitor that takes a composite colour input. It should be noted that the *Datavid-Arc* is only intended as a high-quality PAL encoder, and doesn't offer Genlock. Therefore, the unit cannot be used directly for tasks such as overlaying titles on videos. The *Datavid-Arc* costs £179.99 inc. VAT (plus £1.50 p&p), but for a limited period is available to RISC User and BEEBUG members for the special price of £160 inc. VAT. (plus £1.50). To order the *Datavid-Arc*, or for more details, contact Interactive Media Resources, 8 North Street, Wolverhampton, West Midlands WV1 1RD, tel. (0902) 25444.

DISCTREE

DiscTree from Mitre Software is a multi-tasking utility which replaces the company's *Desktop Enhancer* (DTE),

which is not applicable to RISC OS. *DiscTree* provides facilities to display the directory structure of a disc and find given files. A backup and retrieve utility is also provided, and the package is particularly suited for use with hard disc systems. *DiscTree* costs £49.95 (inc. VAT and postage), or £39.95 for owners of DTE provided that they return the original disc.

Also new from Mitre Software is *TimeWatch* - a desktop based Filofax. *TimeWatch* is fully RISC OS multi-tasking, and allows you to keep track of your appointments, tasks in hand, anniversaries etc. The appointment manager allows you to enter details of the time, estimated duration and nature of any appointment, and you will be automatically reminded of it. There is also a day-to-day notebook feature, and a calendar to allow you to jump quickly to the appointments list for any day. The stored information can also be searched and printed, and for users of the Arthur 1.2 Notepad, files can be imported into *TimeWatch*. The complete package costs £29.95 (inc. VAT and postage). For more details of both packages contact Mitre Software Ltd., International House, 26 Creechurch Lane, London EC3A 5BA, tel. 01-283 4646.

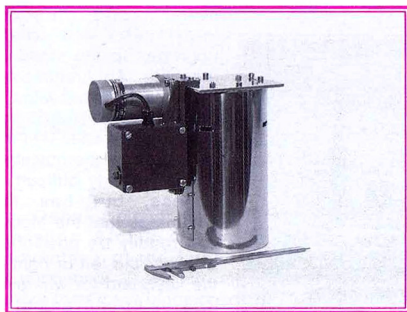
MULTIPLE EXPANSION

The *Multiple Input/Output Podule* from Brainsoft must hold the record for the most features fitted onto a half width podule. The board contains an eight-bit stereo sound digitiser, a mode 12 or 15 video digitiser for still frames, an additional RS232 serial interface, an analogue joystick interface, and three ROM sockets each of which can accept ROMs up to 128K in size, allowing a complete ROM filing system to be implemented. Software for controlling all the hardware is provided in the form of star commands and SWI calls by an additional on-board ROM. The whole podule costs £123.05 (inc. VAT). Also available is a 'Break-out box' which allows composite colour images to be digitised, and this costs £63.25 (inc. VAT). Finally, if you don't already have a backplane, Brainsoft can supply a four-slot version for £63.25, or £74.75 with a cooling fan (both prices inc. VAT). All the items can be ordered directly by sending a cheque for the cost, plus £3 for postage, to Brainsoft, 106 Baker Street, London W1M 1DF, tel. 01-486 0321.

A PORPOISE WITH A PURPOSE

Porpoise Viscometers Limited, a worldwide name in viscometers, use an Archimedes as a central part of

their control system. The viscometer (pictured) measures the viscosity of the polymers used in the production of plastics and resins, and uses this data to control the flow rate and temperature. The Archimedes takes its input from the meter via a special IO podule (see advert in this issue) and both controls flow-rate stepper motors and temperature controllers, and produces an on-screen display of the process. For more information on the viscometers, or the role played by the Archimedes, contact Porpoise Viscometers, Peel House, Peel Road, Skelmersdale, Lancashire WN8 9PT, tel. (0695) 50002.



Porpoise Viscometer

BETTER COMMUNICATION

ArcComm, the long awaited terminal package from BBC Soft has finally been released. The system, which is only compatible with RISC OS, is not multi-tasking and uses BBC Soft's own window layout, this being substantially different from the standard RISC OS appearance. *ArcComm* will work with a wide range of modems including Hayes compatibles (for example the Pace Linnet and the Amstrad SM2400), and 'dumb' modems. There is a VT102 scrolling text terminal which supports X-modem file transfer, and a full viewdata terminal. This supports not only the CEPT level 1 standard used by Prestel, but also the European level 2 and 3 standards, making *ArcComm* the first package to support the French Minitel and German Bildschirmtext systems. *ArcComm* costs £31.45 (inc. VAT and postage), and is available from BBC Soft, PO Box 234, Wetherby, West Yorkshire, LS23 7EU.

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TYPE DOUBLE DUTCH

New from Kador are do-it-yourself key top kits called *Keytops*. Sets of stick-on keytops are available for many languages, including French, Spanish, Italian, German, Arabic, Hindi, Hebrew and Russian. Additionally, Kador can manufacture *Keytops* with any legends of your choice. *Keytops* are held on by a strong adhesive, but can easily be removed if needed, and an obvious application is where the Archimedes is being used for language teaching. *Keytops* start from £17.50 (inc. VAT) a set, and more details can be obtained from Kador, Unit 4, Pontynon Industrial Estate, Abercynon, Mid Glamorgan CF45 4EP, tel. (0443) 740281.

A GOOD SOLUTION

Software Solutions is a new company set up by two former Acorn employees - David Tee and Gary Stephenson. The aim of the company is to produce a number of high quality software products for the secondary education and home/hobby market. All software will be fully integrated into the RISC OS multi-tasking system, and will follow Acorn's detailed guidelines on software presentation. For details of forthcoming products from *Software Solutions*, contact them at 4 Prince Henry Court, Victoria Road, Cambridge, CB4 3NT, tel. (0223) 351380.

PRESTEL GROWS

Micronet users who want a break from reading about computers can take advantage of four new on-screen magazines launched by Dialcom - the owners of Prestel. The magazines are *Newsday* containing the latest news and in-depth stories, *Look!* for leisure and the arts, *SportsEye* for competitors and spectators alike, and *Games City* which provides a wealth of quizzes as well as a gateway into the multi-user game *Shades*. To browse the new magazines simply log on and go directly to page 1.

RISC OS REFERENCE

Acorn has announced that the revised *Programmer's Reference Manual*, which will contain all the new information relevant to RISC OS, will run to four volumes. The new manual should be available from the autumn, although the exact date and price have yet to be announced.

RU

ACORN LAUNCH NEW MICRO

Mike Williams reviews Acorn's recently launched A3000, the new BBC microcomputer.

Since the new year, various magazines including RISC User have carried speculative items on a new Archimedes from Acorn. Now the truth is revealed with Acorn's announcement of the A3000, the new BBC microcomputer.

INTRODUCTION

The A3000 marks a radical change from the Archimedes as we have come to know it, reverting to the single box approach of the BBC micro and Master 128, and used so successfully by the Atari ST and others. The moulded plastic case is in standard Acorn crackle-finish cream. The dimensions of 48.5cm by 32cm by 6.5cm make it about 1cm wider than the Master 128, but the depth from front to back, and the height are less. The new machine has the same 'PC-enhanced' style of keyboard as other Archimedes (built into the front, sloping fascia), but it is of different construction, and has a much lighter and more positive feel to it.

A recessed on/off switch is fitted at the left-hand side, while a standard 3.5" disc drive is built into the right-hand side of the new machine, to the rear of the keyboard. The Reset switch is located beneath this and is also recessed.

The disc drive feels comfortable to access for inserting and removing discs, though the eject button requires a little more effort than I might have wished, and my fingers were often slightly blocked by the edge of the casing. However, I found no confusion in use between the eject button and the Reset switch.

In use, the disc drive is noisier compared to the Archimedes 300 series, but this may be the consequence of the use of a plastic rather than a metal case. One useful touch is the provision of a repeat 'tell-tale' light on the front panel to indicate when the drive is in operation.

All the connectors (bar one) are fitted at the rear of the machine and include analogue RGB, composite video, Econet, printer port, serial port, stereo sound jack and a podule expansion socket (see figure 2). However, the

serial and Econet interfaces are both upgrades to the standard machine. An Archimedes mouse is included with the system, and this plugs into a socket recessed into the underside of the machine. This is clearly difficult of access, but has the advantage that the mouse can readily be positioned to either the left or right of the keyboard (or wherever it is most convenient in use).

The A3000 is designed for use with either an analogue RGB monitor, or one which will accept a mono composite video input. A stand, as in the illustration, will be available to raise any monitor above the casing,

and help ventilation.

HARDWARE

Lifting the lid, which is easily achieved, reveals the power supply, circuit board and disc drive (see figure 3). The power supply is quite unprotected, leaving dangerous voltages exposed, which means (officially at least) that any upgrades are dealer only. The A3000 uses the same ARM chip-set and disc controller and offers the same performance as the latest 400



Fig.1 The new Acorn A3000

series (themselves about 10% faster than the original Archimedes 305 and 310). It is also fitted with RISC OS as standard, which should remove any doubts about software compatibility.

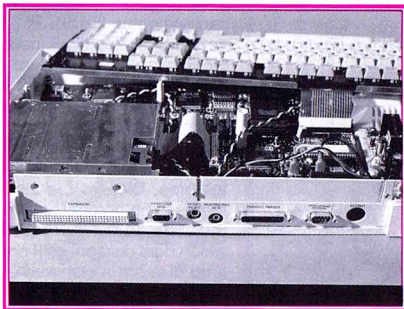


Fig.2 Rear of machine showing sockets as fitted

General circuit layout is very similar to existing Archimedes models, but takes advantage of the latest 'surface mounted' components. These are minute, and look little more than mere blobs of solder. The 1MByte of memory is in the form of eight vertically mounted chips (as on the 400/1) which thus use less space on the board than the more traditional horizontal ones. A row of pins is waiting for the plug-in 1MByte upgrade that will double the memory to 2MBytes, the maximum that the machine is designed to accommodate.

The board also provides for internal expansion. Econet uses the existing plug-in board, while the serial interface requires just two chips to be fitted. Acorn claims that it is using a completely bug-free controller to avoid the problems encountered in earlier Archimedes with the serial interface.

There is also a new-style mini-podule expansion capability. The only suitable podule currently announced is a combined User Port/MIDI interface from Acorn, though other manufacturers will no doubt step in. Only one such podule may be fitted anyway, but no existing podules will fit. However, there is also

an external expansion socket fitted at the rear of the machine, and this will accept single card podules, including a hard disc interface if required. A podule expansion box offering up to four podule connections can also be mounted here. Provision has been included in the moulding for add-ons to be securely attached to the A3000, but this will obviously require a certain amount of re-design on the part of manufacturers

The new machine also sports stereo loud speakers (i.e. using the same miniature speaker as previously fitted), though hardly hi-fi stereo sound. It is very easy to change the stereo position of any sound channel (*STEREO or STEREO in Basic), and the effects were well demonstrated using the Maestro application from one of the two supplied Applications discs.

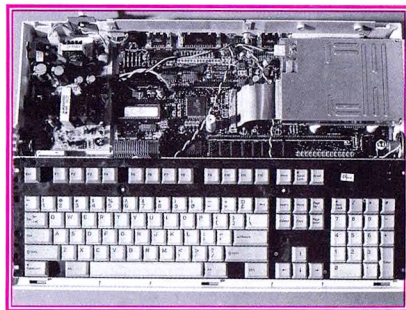


Fig.3 Plan view of the inside of the A3000

The A3000 is also fitted with NiCad battery back-up, the batteries being constantly recharged while the machine is switched on.

SOFTWARE

The A3000 is supplied with the same RISC OS chips as the Archimedes, and thus provides the same multi-tasking WIMP environment. The machine thus includes Archimedes BBC Basic, while standard RISC OS applications such as Edit, Paint and Draw are supplied on two Applications discs, identical (as far as I can judge) to those

ACORN LAUNCH NEW MICRO

supplied with RISC OS on other Archimedes, apart from the disc labels. No support disc is included. Acorn, probably correctly, assume that A3000 users will not be 'upgrading' from any other Archimedes, and that any new software purchased will already have been converted to RISC OS by the supplier.

The 6502 emulator (65Host and 65Tube) is included as part of the system, and there should be no problem in running the PC emulator, although this is not included.

Although the existing ROM set accounts for 0.5MBytes of memory, the design of the A3000 would permit ROM software up to a massive 2MBytes.

One interesting piece of information is that the new machine officially takes over the mantle of 'BBC microcomputer', the revamped 400 series machines on which we reported last month being Acorn-badged only, while the existing 300 series is likely to be phased out shortly.

MANUALS

The A3000 is supplied with a Welcome Guide and a User Guide. These are very similar to the two guides supplied with the RISC OS upgrade, and now with the 300 and 400 series. The Welcome Guide consists largely of new material, as it is specific to the A3000, although very much in the same style as before. The User Guide is essentially unchanged, but there are numerous detailed revisions, and both it and the Welcome Guide have been completely re-typeset with new style covers. Curiously, neither manual now makes any reference (as far as I could find) to the 'Archimedes' name.

No guide to Basic is supplied with the A3000. The new owner is therefore faced with

the additional purchase of the Acorn BBC Basic Guide (£19.95), unlike purchasers of the 400 series where it is supplied as standard.

The A3000 System

Hardware

- Single box design
- 1Mb RAM (expandable to 2MBytes)
- Internal 3.5" 800K floppy disc
- Internal stereo speakers
- NiCad battery back-up
- Mouse
- Side-mounted on/off switch
- Integral power supply

Connectors

- Centronics compatible printer
- Analogue RGB
- Mono composite video
- Stereo sound
- Econet (option)
- Expansion connector (for podules)
- User port/MIDI (internal expansion)
- Serial (internal expansion)
- User port for Concept Keyboard

Price

- £649 ex. VAT (£746.35 inc. VAT)
- Monitor extra.

COMMENT

It is good to see Acorn capitalising on the power and flexibility of the Archimedes by packaging it up into an Atari style machine. It is fully Archimedes and RISC OS compatible with no dilution or watering down of the Archimedes' essential features. Clearly it is aimed more at the home user (than the business market for which dual disc drives if not a hard disc are a standard and essential requisite). It is also likely that Acorn will target the machine strongly into the educational market, where it may well prove successful as a lower cost entry system for primary schools, and as a cheaper network station for Econet systems.

Has Acorn got the price right? That is always a difficult question to answer, and in fact there is no absolute answer. If the A3000 captures the public imagination and becomes THE machine to buy and be seen buying, Acorn would probably feel that they had priced the machine too low. If it is seen as a relative failure, then critics will no doubt argue that it is because Acorn set the price too high. On first impressions Acorn has got the price about right. The Archimedes has already established itself as one of the most desirable micros around, and packaging that up as Acorn has done at a lower price has to be a good move.

Lastly, the question is, "When will the new machine be ready?" Acorn says that it will be available in quantity by the time of the BBC Acorn User Show in July, which will also be the first public showing for the new machine. All in all, exciting times lie ahead for Acorn.

RU

BBC Acorn User Show

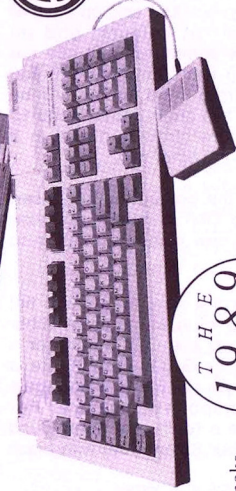
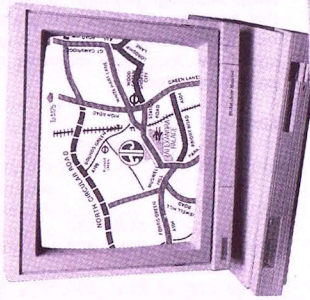
BBC ACORN USER, with the backing of the BBC and the enthusiastic support of Acorn Computers, have together planned what could be the most exciting computing event of the year.

The new, all-action BBC ACORN USER SHOW is back, at the first home of BBC TV - Alexandra Palace featuring:-

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RUI

32,000 COLOURS IN MODE 15

by Barry Christie and Lee Calcraft

The maximum number of colours that you can have on screen at any one time on the Archimedes is 256. But by using a technique known as dithering, it is possible to increase that number to a staggering 32,000. Essentially, dithering involves mixing two or more colours on a pixel by pixel basis so that the eye perceives a single colour.

The program in listing 1 contains a procedure called PROCdither, which takes as parameters a pair of colour and tint numbers, and a flag indicating whether the foreground (TRUE) or background (FALSE) is to be dithered. Calling the procedure sets up a dither pattern for the pair of colours; and all subsequent graphics commands will use the new colour (including text after VDU5). If you run the program, three filled circles will be displayed. The outer two are in native mode 15 colours, but the centre circle is drawn in a colour made up from the other two.

To make use of the procedure, just insert your own GCOL and TINT numbers, and then proceed to use the new colour. To return to normal colours, use:

```
GCOL n TINT m
```

where n and m are the new colour and tint which you require. To return to the same dither pattern you can simply use GCOL 80,0 for a foreground colour, or GCOL 80,128 for a background; or you can call PROCdither again with your new component colours. For example, to produce a (dull) grey foreground by mixing white (colour 63 tint 192) with black (colour 0 tint 0), use:

```
PROCdither (63,192,0,0,TRUE)
```

Selecting dither combinations to produce a precise colour is no easy task, but the program in listing 2 should make the job a little easier. If you type it in carefully, and run it, you will see that the screen is split into three areas. The top two sections contain colour palette displays, while the bottom part is a drawing area.

First select a colour from the lower palette using the *Select* button. The top palette will

immediately alter to display the 256 new colours that can be generated using the selected colour as one of the two components. You can now select one of the (dithered) colours from the top palette, and draw with this in the sketch area below.

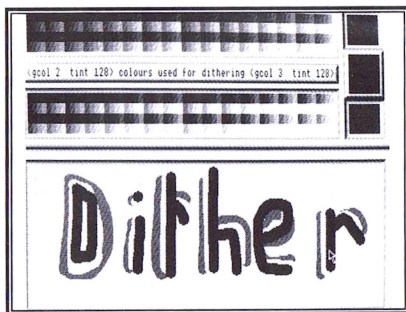
When colour selections are made, a display appears giving the exact colour and tint numbers used, and these may be noted for subsequent use with PROCdither, as described above.

The technique used in this article makes extensive use of the so-called ECF patterns, and we will take a closer look at these in a future issue.

Note: Although the high resolution provided by the Arc's mode 15 is adequate for the pixel mixing techniques used in these programs, some low resolution monitors may show fine patterning effects.

Listing 1

```
10 REM >DitherTest
20 REM by Lee Calcraft
30 :
40 MODE15
50 GCOL 3 TINT 192
60 CIRCLE FILL 300,500,250
70 GCOL 14
80 CIRCLE FILL 980,500,250
90 PROCdither (3,192,14,0,TRUE)
100 CIRCLE FILL 640,500,300
110 END
120 :
130 DEFPROCdither (gcola,tinta,gcolb,ti
ntb,foreground)
140 LOCAL A,B
150 A=tinta DIV 64+(gcola AND 33)*4+(g
cola AND 14)*8+(gcola AND 16)/2
160 B=tintb DIV 64+(gcolb AND 33)*4+(g
colb AND 14)*8+(gcolb AND 16)/2
170 VDU 23,2,A,B,A,B,A,B,A,B
180 VDU 23,3,B,A,B,A,B,A,B,A,B
190 VDU 23,4,A,B,A,B,A,B,A,B
200 VDU 23,5,B,A,B,A,B,A,B,A,B
210 GCOL 80,128+foreground*128
220 ENDPROC
```

Colour mixer screen

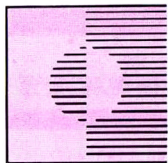
Listing 2

```

10 REM >Dither
20 REM Program Colour Mixer
30 REM Version A 0.3
40 REM Author Barry W. Christie
50 REM RISC User June 1989
60 REM Program Subject to Copyright
70 :
80 MODE 15:OFF
90 PROCinitialise
100 WHILE mbut<>1
110 IF FNslabarea( 3,37,64, 8,4) THEN
PROCcolourchoose
120 IF FNslabarea( 3,53,64, 8,4) THEN
PROCditherchoose
130 IF FNslabarea( 2, 2,76,30,4) THEN
PROCditherdoodle
140 PROCmouse
150 ENDWHILE
160 END
170 :
180 DEF PROCcolourchoose
190 WHILE FNslabarea( 3,37,64, 8,4)
200 PROCgcoltint:PROCcolrmenu( 3, 52,0,
byteb):PROCmouse
210 ENDWHILE
220 ENDPROC
230 :
240 DEF PROCditherchoose
250 WHILE FNslabarea( 3,53,64, 8,4)
260 PROCgcoltint:PROCmouse
270 ENDWHILE
280 ENDPROC
290 :
300 DEF PROCditherdoodle
310 MOUSE RECTANGLE 48,48,1183,447
320 VDU 24,48;48;1231;495;
330 WHILE FNslabarea( 2, 2,76,30,4)
340 CIRCLE FILL mxco,myco,16:PROCmouse
350 ENDWHILE
360 MOUSE RECTANGLE 0,0,1279,1023
370 VDU 26
380 ENDPROC
390 :
400 DEF PROCgcoltint
410 gcolx=(mxco DIV 16)*16:gcoly=(myco
DIV 16)*16
420 bytea=FNcolrbyte(gcolx+0,gcoly)
430 byteb=FNcolrbyte(gcolx+2,gcoly)
440 gcola=POINT(gcolx+0,gcoly)
450 tinta=TINT(gcolx+0,gcoly)
460 gcolb=POINT(gcolx+2,gcoly)
470 tintb=TINT(gcolx+2,gcoly)
480 VDU 23,2,bytea,byteb,bytea,byteb,b
ytea,byteb,bytea,byteb
490 VDU 23,3,byteb,bytea,byteb,bytea,b
yteb,bytea,byteb,bytea
500 VDU 23,4,bytea,byteb,bytea,byteb,b
ytea,byteb,bytea,byteb
510 VDU 23,5,byteb,bytea,byteb,bytea,b
yteb,bytea,byteb,bytea
520 GCOL gcola TINT tinta
530 RECTANGLE FILL 1120,879,111,95
540 GCOL gcolb TINT tintb
550 RECTANGLE FILL 1120,592,111,95
560 GCOL 80,0
570 RECTANGLE FILL 1120,720,111,127
580 PRINT TAB( 9,7)FNnmbrtext(gcola,2)
TAB(17,7)FNnmbrtext(tinta,3)
590 PRINT TAB(55,7)FNnmbrtext(gcolb,2)
TAB(63,7)FNnmbrtext(tintb,3)
600 ENDPROC
610 :
620 DEF PROCcolrmenu(menux,menuy,menut
,menus)
630 !addr=scrnbase+menux*8+(55-menuy)*
&A00
640 !colr=menus:A%=menut
650 CALL draw
660 ENDPROC
670 :
680 DEF PROCslab(slabx,slaby,slabw,sla
bh,slabt)
690 slabx=slabx*16:slabw=slabw*16-1
700 slaby=slaby*16:slabh=slabh*16-1
710 FOR slabbits=0 TO 3

```

Continued on page 25



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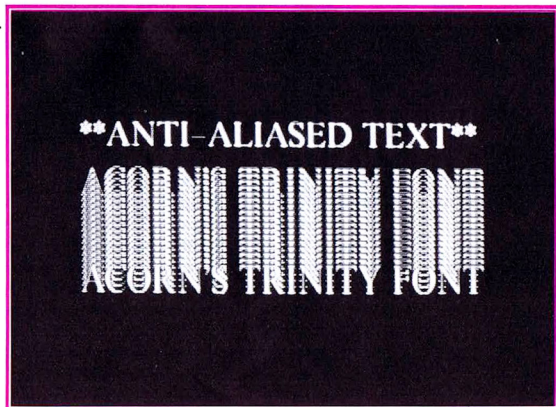
Anti-Alias Fonts in the 256 Colour Modes

by Lee Calcraft

The implementation of anti-alias fonts on the Archimedes was an innovatory step. This method of providing high quality text is normally associated with powerful graphics engines, and in particular with broadcast quality titling systems such as that used in the legendary Quantel Paintbox. But the native speed of the ARM processor makes this feasible on the Arc.

Reference Manual documents a considerable number of SWIs dedicated to font use.

In RISC User Volume 1 Issue 3 we took an introductory look at the use of anti-alias fonts on the Arc, concentrating on their use in the 16 colour modes. In the present article the investigation is extended into the 256 colour modes. In doing so we can dispel a major restriction claimed to hold for these modes. In the *Programmer's Reference Manual* it specifically states that anti-alias fonts are ORed onto the screen, with the result that you must generally use a background colour of 0 (thus restricting you to a black background in the 256 colour modes, where the palette is not easily redefined). Fortunately this is not the case, and any background colour may be used.



Sample anti-aliased fonts in mode 15

The distinguishing feature of these fonts is that special algorithms are used which attempt to reduce the ragged edges caused by the finite size of each pixel. This is achieved by inserting pixels at the boundaries of each character in colours intermediate between the foreground and background colours, thus blurring otherwise jagged edges.

The software support for the Arc's anti-alias fonts is good. The Arthur 1.2 Welcome disc contained two font styles (Corpus and Trinity), and the new RISC OS Applications disc 1 contains three (Corpus, Trinity and Porterhouse). Additionally, the *Programmer's*

screen. In the 16 colour modes there is a serious colour limitation. To generate decent looking text you need to set aside at least 4 (and preferably 8) colours for the anti-aliasing palette for each text colour, and the font manager redefines them to the physical colours required for painting the text.

In the 256 colour modes, the palette is not redefined, instead the Font Manager attempts to allocate an appropriate set of pre-defined colours for the job; though how well it achieves this in practice depends on the colours chosen by the user. Because the palette is not redefined, all 256 colours

remain at the user's disposal, and it is therefore possible to construct screens containing, for example, full colour digitised images together with anti-aliased text in a wide variety of colours.

THE PROGRAM

Without further ado we will get down to the practicalities of anti-aliased text in mode 15. The accompanying program demonstrates the major calls used for the 256 colour modes, and parcels them up, as far as possible, into a number of customisable procedures and functions.

To begin with, type in the program and save it to disc. Before running it you will need to configure some font space (30 or 40K will be more than adequate). Either use:

```
*Config.Font.10 then Ctrl-Break
```

or use the RISC OS Task Manager. Next, install on your current disc the following directory sequence:

```
$.FONTS.TRINITY.MEDIUM
```

Into the directory MEDIUM, copy the two files:

```
IntMetrics
```

and `x90y45`

from the Arthur 1.2 Welcome disc directory:

```
FONTS.TRINITY.MEDIUM
```

or from the RISC OS Applications disc 1:

```
!FONTS.TRINITY.MEDIUM
```

Now you can run the program! You should see a dark blue background with anti-alias text in white. Then a line of text in yellow bordered with red should appear and drift down the screen leaving a "trail". The first time around the program will take several seconds to run, but when repeated it will execute in just less than a second, displaying each line of text in around 0.05 seconds. The excellent timing on subsequent displays is a result of the font caching process which takes place in the area of RAM set aside for the purpose, above. To check the cache, use:

```
*FontList
```

The additional command `*FontCat` will list the names of fonts stored on your current disc.

HOW IT WORKS

The main program loop is simple. Fonts are initialised, colours are initialised, text is written, and the fonts put on hold (by `PROCtidy`). The font initialising procedure `PROCinitfont` has two functions. Firstly it establishes the so-called font pre `<`. This is just the directory path to where the fonts are stored (in this case: `$.FONTS`). It then sets up two font sizes in Trinity medium, and assigns so-called font handles for each (these are held in `font1` and `font2`). The first has a point size of 30 (line 540), and the second of 30 horizontally by 35 vertically (line 560), though these may be altered as required.

The colours used for the fonts are set up in `PROCinitcols`. This uses the block of data at line 390. The first item (currently set to 2) tells the procedure how many anti-alias palettes are to be set up. It then reads in the foreground and background colour and tint for each. The first palette uses colour 63 tint 192 (white) and background 32 tint 0 (mirroring the background colour set up in line 90), while the second uses a yellow foreground and a red background, causing the red bordering effect on the second set of text.

The procedure `PROCinitcols` may be expanded to set up as many as 16 colour palettes. Each is subsequently referred to by a number `n`, where `n=1` refers to the first defined palette, and so on. As you may have noticed, `PROCinitcols` calls `FNconvert`. The purpose of this is to convert the user-supplied values of `GCOL` and `TINT` for foreground and background into the special form required by `SYS "Font_SetPalette"`.

The text is actually written using `PROCwrite`. This takes five parameters: the font number (this is the handle returned when the font was initialised - `font1` or `font2` in this case), the palette number as defined above, the `X` and `Y` co-ordinates of the start of the text (in graphics units), and finally the text

string itself. As you can see, this procedure makes three SYS calls: "Font_SetFont" to establish the required font as the current font, "Font_SetFontColours" to establish a particular palette, and "Font_Paint" to paint the current font on the screen using the currently selected font palette.

Note by the way, that the *Programmer's Reference Manual* misses a vital "s" from the end of the name of the SYS call "Font_SetFontColours", and that the fourth parameter (=14) in both this call and "Font_SetPalette" is confusingly referred to as a "foreground offset". It is in fact the number of anti-alias levels to be set between foreground and background. In 256 colour modes, this would normally be set to 14, indicating that the font manager should attempt to set up a 16 level palette - though depending on the foreground and background colours specified, it will not always fully achieve this goal.

```

10 REM          >FontDemo
20 REM Program   Anti-Alias Fonts
30 REM Version   A 0.3
40 REM Author    Lee Calcraft
50 REM RISC User June 1989
60 REM Program   Subject to Copyright
70 :
80 MODE15
90 GCOL 32+128:CLG:REM Blue Bcgn
100 PROCinitfont
110 PROCinitcols
120 REM Title text
130 PROCwrite(font1,1,200,800,"**ANTI-
ALIASED TEXT**")
140 REM Drift effect
150 FOR Z=700 TO 500 STEP -12
160 PROCwrite(font2,2,200,Z,"ACORN'S T
RINITY FONT")
170 NEXT
180 PROCTidy
190 END
200 :-----
210 DEFPROCwrite(font,col,X,Y,text$)
220 SYS "Font_SetFont",font

```

```

230 SYS "Font_SetFontColours",,,col,14
240 SYS "Font_Paint",,text$,20,X,Y
250 ENDPROC
260 :-----
270 DEFPROCinitcols
280 READ totpal
290 FOR n=1 TO totpal
300 READ gcol,tint
310 fgnd%=FNconvert(gcol,tint)
320 READ gcol,tint
330 bgnd%=FNconvert(gcol,tint)
340 REM Anti-alias palette (index 1)
350 SYS"Font_SetPalette",,,n,14,bgnd%,
fgnd%
360 NEXT
370 ENDPROC
380 :-----
390 REM data: no of sets then
400 REM fgnd gcol,tint, bgnd gcol,tint
410 DATA 2
420 DATA 63, 192, 32, 0
430 DATA 15, 192, 2, 0
440 :-----
450 DEFNconvert(gcol,tint)
460 tint=tint>>>6
470 red=((gcol AND 3)<<2)+tint
480 green=(gcol AND 12)+tint
490 blue=((gcol AND 48)>>>2)+tint
500 =(red<<12)+(green<<20)+(blue<<28)
510 :-----
520 DEFPROCinitfont
530 *SET Font$Prefix $.FONTS
540 xpoint=30:ypoint=30
550 SYS "Font_FindFont",,"Trinity.Medi
um",xpoint*16,ypoint*16 TO font1
560 xpoint=30:ypoint=35
570 SYS "Font_FindFont",,"Trinity.Medi
um",xpoint*16,ypoint*16 TO font2
580 ENDPROC
590 :-----
600 DEFPROCTidy
610 SYS "Font_LoseFont",font1
620 SYS "Font_LoseFont",font2
630 ENDPROC
640 :-----

```

ARCHIMEDES SOFTWARE

Spark - A new file archiver for RISC OS

Spark is a new version of the popular file compressor/archiver program 'arc' rewritten and extended for RISC OS. Spark, is completely WIMP based and fully multitasking. The contents of archives are displayed just like the contents of disc directories, in viewers. Files can be dragged out of archives and onto disc and from disc into archives. It is even possible to drag a file straight from an archive and into an application or from an application and into an archive.

A brand new feature of Spark, is that directories can be archived and it is possible to move around the directories in the archive and add or delete files. Spark will be of use to users of 'arc' e.g. for communications. However, Spark is so easy to use, that it has many new uses. For example, one could have 2Mb. of Clip Art on an 800K floppy and simply drag the required files into a DTP package without unpacking the entire archive.

Spark, is compatible with IBM PC 'arc' and pkarc files as well as with the older Archimedes arc files. All the old 'arc' features are present like squashing and encryption. However, the difficult command line interface of the old 'arc' is replaced by easy to use menus and icons.

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INSTANT SCALED TEXT

Lee Calcraft examines another very useful RISC OS sprite call

This program requires RISC OS

One of the new calls in the RISC OS Sprite Extension Module makes it very easy to display text on the screen at any height and width. If you wondered how the Desktop manages to display text at 80 column width regardless of mode, it is by making use of this call, and it even works in text-only modes.



Scaled text in three sizes

To make it simple to use, I have parcelled up the call into a procedure which will take a string of text and display it at a specified height and width in the current graphics foreground colour. The procedure, PROCtext, takes five parameters: the x and y co-ordinates of the start of the display, the horizontal and vertical magnification (to reduce, use a magnification less than one), and the text string itself.

The accompanying program contains three examples of the use of the procedure. And you will see that there is an additional function, FNspacing, which calculates the required spacing between characters for the mode in use. As you can see, the text colour is set each time using GCOL immediately before the call.

```
10 REM          >Scaled
20 REM Program   Scaled Text
30 REM Version   A 0.2
40 REM Author    Lee Calcraft
```

```
50 REM RISC User June 1989
60 REM Program   Subject to Copyright
70 :
80 MODE12
90 DIM scale% 16
100 GCOL 3
110 PROCtext(0,700,7,7,"Scaled Text")
120 GCOL 1
130 PROCtext(0,300,4,12,"any mode")
140 GCOL 2
150 PROCtext(0,100,7,3,"any size")
160 END
170 :
180 DEFPROCtext(x,y,mx,my,text$)
190 scale%!0=mx*16:scale%!4=my*16
200 scale%!8=16:scale%!12=16
210 spacing=mx*FNspacing
220 FOR A%=1 TO LEN(text$)
230 C%=ASC(MID$(text$,A%,1))
240 SYS "OS_SpriteOp",51,C%,x+(A%-1)*
spacing,y,,scale%
250 NEXT
260 ENDPROC
270 :
280 DEFFNspacing
290 CASE MODE OF
300 WHEN 1,4,6,7,9,13:w=32
310 WHEN 2,5,10      :w=64
320 OTHERWISE        :w=16
330 ENDCASE
340 =w
```

SYS call: "OS_SpriteOp"

Reason code: 51

Registers on entry:

R0 51 (&33)

R1 Character code (ASCII)

R2 Not used

R3 X co-ordinate

R4 Y co-ordinate

R5 Not used

R6 This must point to a 16 byte block containing four 4-byte scaling factors. For further details, see "RISC OS Sprite Calls" in the last issue.



The Hard Facts on Hard Discs

David Spencer looks at the hard disc upgrades from Watford Electronics and Acorn, and gives some practical advice on managing a hard drive.

I'm sure that if you asked all Archimedes owners what upgrade they most wanted, then a hard disc drive would just beat a multi-sync monitor into first place. This is hardly surprising when you compare the speed and elegance of a hard disc to floppies. Not only does it offer loading and saving many times faster than a floppy, but also a 20Mbyte hard disc can hold the equivalent of almost 25 floppies. However, as always, luxury costs, and to many owners a hard disc upgrade represents a considerable investment. In this article I shall take a closer look at hard disc systems, and compare the two most popular upgrades currently available.

WHAT'S IN A DRIVE?

Before looking at individual products, let us look briefly at what makes up a hard disc system, and how it differs from a floppy. As with a floppy system, there are two main parts - the disc controller and the drive itself. In both cases, the controller consists of a collection of chips, and other components, which for a floppy are mounted on the Archimedes' main circuit board. On a 400 series computer the hard disc controller is also mounted on the main board, and in fact there is provision for

this on the 300 series. However, all the relevant pads on the circuit board are clogged with solder, and a much simpler solution is to put the hard disc controller on a module which mounts on a backplane. Wherever the controller is

located, the software to access it is provided as standard in the ADFS module, and this therefore forces any hard disc upgrade to use the same controller chip (an Hitachi HD63463 to be exact). This also means that from a software point of view all hard disc upgrades are identical.

Turning to the drive, in many ways a hard drive is similar to a floppy. But, unlike a floppy, a hard drive consists of more than one disc (normally two), and these are all

mounted on the same spindle and driven by the same motor. Each side of every disc has its own read/write head, and these are all moved by the same stepper motor. A hard disc is split into many more tracks than a floppy - typically 620. The main difference between a hard drive and a floppy is the positioning of the heads. On a floppy the heads sit tight against the discs. This causes wear, and at the increased speed of rotation of a hard disc would be impractical. Therefore, in a hard drive the heads float very slightly above the

CARE OF HARD DISCS

Because a hard drive is hidden away inside the computer, there is a great tendency to forget all about it. To an extent this is a reasonable stance to take, as hard drives require no routine maintenance, cleaning or the like. However, hard drives are very fragile and must be treated with the utmost respect when they are handled. Before turning off the computer, the hard drive must be parked with the command `*BYE` (or `*DISMOUNT`). This moves the head to a safe *landing track* because as soon as the drive is powered down the air flow will stop and the head will *crash* against the disc. If this was to occur on a track containing data, then it is possible that the data would be corrupted, and the drive need reformatting. On a similar note, a computer fitted with a hard drive should never be moved unless the heads are parked and the computer turned off. Additionally, sudden jolts and knocks should be avoided. You should not remove the drive from the computer unless really necessary, and you should *NEVER* attempt to dismantle a hard drive, as this will invariably ruin it.

ORGANISING A HARD DISC

When most people fit a hard disc, the first thing they do is to copy all their most used floppies onto it. This can very quickly lead to utter chaos in disc organisation, and make finding a particular file a nightmare. Even if each individual floppy contained a perfectly logical directory structure, when over twenty such discs are combined the logic can soon break down.

One simple solution that can be adopted when transferring *n* floppies to a hard disc is to create *n* directories in the root of the hard disc, and copy the contents of each floppy directly into these directories. This will mean that the structure is maintained exactly as before, but with all the files accessible at all times. A much better solution though is to create a number of sub-directories according to different type of programs. For example, you could have a directory for Basic programs, one for C programs, a word processing directory etc.

surface of the disc on a layer of air that is forced through the drive spindle by a fan mounted on the spindle, and then out through holes over the discs. This means that there is effectively no wear on the disc or the head. The entire drive mechanism is enclosed in an air-tight package, the air within being free of dust particles etc. A breather vent in the drive allows for any large and sudden changes in atmospheric pressure.

THE ACORN AND WATFORD UPGRADES

These are the two most popular upgrades for the 300 series, and both consist of an internally mounted 20Mbyte 3.5" hard drive, and a podule carrying the hard disc controller. When installing either, it will be necessary to add a podule backplane and cooling fan to the Archimedes.

The fitting of both upgrades is relatively straightforward. The podule is a half-width unit, and unless it is fitted next to an existing podule, it will be necessary to use the blanking plate and joiner provided with the upgrade. The drive itself is then mounted next to the existing floppy. On the Acorn system a 'U' shaped bracket holds the drive in place, while the Watford drive uses two angle brackets. In both cases fitting involves only the insertion of a few screws. Once the drive has been mounted, it must be connected up. There are two ribbon cables between the podule and the drive, and a power cable which is already present in the computer. Connecting these is simple. With the Acorn upgrade you must also fit the 'Hard Disc' LED to the front panel and change the front sticker. The Watford unit does not have any drive in-use indicator - no great loss really.

for a number of practical disc operations for the Acorn and Watford systems, and a floppy for comparison. The store benchmark involves writing a number of strings using PRINT#.

DOCUMENTATION

The watford documentation consists of a few pieces of A5 paper stapled together. This 'manual' gives instructions for fitting, and also shows how the podule can be used to connect an external drive instead of the internal unit. The Acorn system is classed as a *dealer only upgrade*, and is supplied with no documentation at all. To this end, the Acorn system is even supplied without a formatter program, this being up to the dealer to supply.

ACORN VERSUS WATFORD

We have already said that both upgrades are identical in terms of software, and as can be seen from the table, there is little difference in speed. One area where the two drives do differ is in terms of noise. Both have a similar background noise (about the same as produced by the fan), but the track-to-track stepping of the Watford unit is more 'clonky' than the Acorn one. It is too early to comment on the reliability of either system. Another plus feature of the Acorn upgrade is the ability to add a second drive to the controller by soldering a connector to the board and mounting the drive externally. However, the main area of difference is the price - £435 for the Watford system and £567 for Acorn's. You may feel that it is worth paying an extra £132 for a slightly quieter drive and the ability to add a second drive, but most users, given the choice, would probably opt for the Watford system.

Operation	Floppy	Acorn	Watford
Screensave (80K)	4.58	0.52	0.51
Screenload (80K)	3.37	0.33	0.32
*SAVE 80K	3.96	0.43	0.32
*LOAD 80K	3.37	0.34	0.29
PCW Store Benchmark	2.99	1.43	1.19

**Table 1. Disc operation speed
(All values in seconds)**

DRIVE SPEED

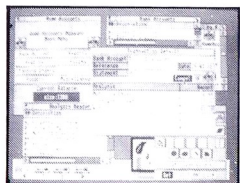
With all hard disc upgrades being identical in terms of software, all that there really is to choose between them is access speed, price, noise and reliability. Table 1 shows the timings

Product	Watford Electronics 20Mbyte hard disc & Controller
Supplier	Watford Electronics, 250 High Street, Watford WD1 2AN.
Price	£435.85 (inc. VAT)

Product	Acorn 20Mbyte hard disc & Controller
Supplier	Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN.
Price	£567.74 (inc. VAT)

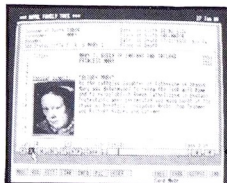
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Into the ARC

Mike Williams introduces our new series for newcomers to the Archimedes, and deals in this first article with some advice on the best ways of writing a program.

INTRODUCING THE SERIES

Regular readers will know that we have featured a number of letters from RISC User members asking for information which is pitched more for the less experienced user than hitherto. Since the Archimedes was launched, to enthusiastic acclaim, many existing BBC micro owners have been among the first to purchase this new machine. Since then, the Archimedes has become an established feature of the UK micro-computer market, and is increasingly being purchased by users who have not previously owned a BBC micro.

With the increasing number of pages in RISC User, we feel that now is the appropriate time to start a new series of articles. It will be aimed at all those readers who wish to get to know their machine more fully, and to make better and more effective use of their system. The essential point is that we shall try to ensure that everything is explained in straightforward and simple terms that all readers can understand. It does not imply that we shall be dealing only with the simplest aspects of the Archimedes.

The series will often be concerned with programming in Basic, but it will cover any and every aspect of using the Archimedes, including RISC OS, as may seem appropriate. Furthermore, we assume that you probably already have an Archimedes and have read (or started to read) the various Acorn guides supplied with your system. We shall also expect you to understand something of programming already. Above all else we shall be concerned with how things work on an Archimedes, so if you have used other micros extensively, you should find much to interest you in these articles.

We hope that you will find this series useful, and even some of the 'experts' may still find they have something to learn from time to time. We would also very much welcome your own views on what this series should cover, both general and specific.

APPROACHES TO PROGRAMMING

To begin our new series I propose to look at the whole question of how best to write and develop a Basic program. Writing any program is a demanding activity, yet one which many people find highly satisfying. There is no one best way to write any program, but there are many good ideas which will help you to develop programs faster and more reliably. There is also the problem of choosing the best and most appropriate features of Basic to implement any particular task.

Basic V, the version of Basic used on the Archimedes, is a very rich version of this widely used programming language. If you have used Basic on other computers, or maybe read books on Basic which are not specific to the Archimedes, you may well be surprised (possibly daunted) at the wealth of instructions and functions which Basic V has to offer. You should also remember that Basic V, which is the latest and fullest version of BBC Basic used on all previous BBC micros, contains a good few features which have been included more to maintain compatibility with earlier and more primitive versions of Basic, rather than because they are desirable features in their own right. So you can see that it is important to know how to select the best approach to any task.

Let's get one thing clear straight away. I have seen many programs written in BBC Basic since the BBC micro was first launched back in November 1981, and there is plenty of guidance and experience on the best way to construct and write a program in BBC Basic. And yet I still see many programs which, in my view, are very badly written. What characterises these poorer programs is so often the use of the dreaded 'GOTO'.

But what is so terrible about the use of GOTO? I will tell you. Partly it is that GOTO gives no indication of what is to follow, that is, it is not descriptive of the next task the program will perform. Does that really matter? Well I, and I am sure many others, believe that

Into the ARC

it does. Few programs are written in their final form first time, so that they work immediately and are never modified.

A better approach is to use a function or procedure. This means identifying a task within a program, and then writing the code for that task and giving it a unique meaningful name, so that whenever and wherever that task is required we need simply refer to it by name. That makes any program much easier to follow and understand; it also makes a program much easier to develop in the first place.

Furthermore, in my experience, the use of GOTO often leads to a poor and inefficient style of programming culminating in the so-called spaghetti program apparently containing little more than hordes of convoluted and intertwined GOTOs. This is all very indigestible, and quite unnecessary in virtually every case. So banish the GOTO from your own programs, and it will transform your programming overnight (as they say).

DESIGNING A PROGRAM

Suppose you want to write a program for some purpose. How should one best approach this task? In the most trivial of examples you can probably just sit down at the keyboard and type in the instructions. The result may be a little crude, but it usually doesn't take long to get something working. This approach is quite adequate for short, often temporary programs that you may need to write from time to time.

Most programs will, however, benefit from some thought and planning before you put hand to keyboard. Often, you may at the outset have only a vague and general idea of how you want something to work. That doesn't matter, as the use of functions and procedures is ideally suited to cope with this. Experience also plays a major part, and the more programs you write the more you are likely to feel that initial planning is unnecessary. Beware! I have fallen into this trap, and ended up spending much time sorting out the logic of a too hastily written program which would clearly have been avoided by better initial planning.

So what should you do? Well, the traditional mainframe approach was to draw a detailed flow chart before writing any code whatsoever. But the advent of 'instant action' micros has changed that. I would not now recommend a fully detailed flowchart, but they still have a useful role to play in ensuring that any routines where the logic is likely to be complex, are properly thought out in advance. Get the principles right and the implementation in Basic is far less likely to be wrong.

The approach which I generally favour is quite simple: just write down in ordinary (maybe abbreviated) English what you want your program to do. Initially this may look quite vague, for example:

```
Initialisation
Set up screen display
Repeat
Get user input
Process input
Display results
Until finished
```

Even without adding any more detail at all, we can convert this into a program in Basic using procedure calls, thus:

```
100 PROCinitialise
110 PROCscreen
120 REPEAT
130 PROCinput
140 PROCprocess
150 PROCdisplay
160 UNTIL finish
170 END
```

Now that won't work if we type it in and try to run it because none of the procedures has been defined. Even though we don't know yet what each procedure will do (in detail), we can still write sufficient to make everything work. So add:

```
1000 DEF PROCinitialise
1090 ENDPROC
1100 :
1200 DEF PROCscreen
1290 ENDPROC
1300 :
1400 DEF PROCinput
1490 ENDPROC
1500 :
```



```
1600 DEF PROCprocess
1690 ENDPROC
1700 :
1800 DEF PROCdisplay
1890 ENDPROC
1900 :
```

The program will now work correctly, but will achieve very little as all the procedure definitions are empty. We have in effect created a skeleton for our program. We can now proceed to add the flesh.

The next step would be to take each procedure definition in turn and begin to fill in the detail. It may be that you can directly type in the necessary Basic instructions. If it is at all complex you may find it easier to write down a description first, and you will often find that the best solution is a mixture of detailed Basic and calls to further procedures or functions yet to be defined. For example, the procedure PROCscreen might be described as:

```
Display title
Display instructions
Display menu
```

The precise structure, and the choice of procedure names, will depend on your own application, but the principles remain the same.

What is also important is to fill in the detail a step at a time, and to test as carefully as possible each step before moving on to the next. Type in the instructions that will make up PROCinitialise (setting any starting values for variables, arrays, and any other settings - cursor off for example), and then test that this is correct before implementing the next procedure.

This is clearly an ideal approach, and one which may seem over laborious. The choice is yours. I am sure that we have all rushed on occasion in adding too much code without proper testing, only to regret our haste later. Even large and complex programs can be implemented successfully by this stepwise approach, gradually refining the levels of detail within the program, and testing carefully at each stage. The essence is the division of any program into small independent but linked

routines. Each routine is then small enough (about 20 lines of code is the most which is manageable) that it is easily understood, written and tested, whereas it quickly becomes quite impossible to cope at once with everything in a complete program.

PROGRAMMING STRUCTURES

One further aid in Basic V is being aware of and using the many different structures which are provided. All versions of Basic allow a FOR-NEXT loop which counts the number of times that the enclosed code is repeated. Basic V also provides REPEAT-UNTIL and WHILE-ENDWHILE to implement conditional loops, where the number of repetitions is not known in advance but determined by a condition which is repeatedly tested. As with functions and procedures, try to make loops self-contained pieces of code.

As well as a repeated section of code, the other essential requirement of any programming language is the facility for the program to choose between two (or more) alternative courses of action dependent upon data values at the time. The simplest form is the standard IF-THEN-ELSE, but Basic V also provides a much more comprehensive IF-THEN-ELSE-ENDIF structure which avoids the obvious (and sometimes less obvious) ambiguities of the simpler and more standard form. What is particularly useful in Basic V is the presence of a CASE statement. This is a device for choosing one from a number of alternatives, and is a much more effective means of doing this in many cases than using multiple or nested IF-THEN-ELSE statements.

In all these respects, Basic V has very much more to offer than implementations on most other machines. All of the structures which I have referred to have an important role to play, and we shall be looking in more detail at the practical use of many of these in future articles in this series. If you are not already familiar with these programming techniques, then I suggest you look them up in the guides that come with your Archimedes and begin to use them in your own programs. They are well worthwhile.

ARE YOU GOOD ENOUGH?

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```

720 gcolbit1=(slabbits DIV 2)*21+21
730 gcolbit2=gcolbit1+21
740 IF slabt=1 THEN SWAP gcolbit1,gcol
bit2
750 GCOL 0 TINT (slabbits MOD 2)*128
760 GCOL gcolbit1:RECTANGLE FILL slabx
+0,slaby,slabw-0,slabh-0
770 GCOL gcolbit2:RECTANGLE FILL slabx
+4,slaby,slabw-4,slabh-4
780 slabx+=4:slaby+=4
790 slabw-=8:slabh-=8
800 NEXT slabbits
810 GCOL 42 TINT 192:RECTANGLE FILL sl
abx,slaby,slabw,slabh
820 ENDPROC
830 :
840 DEF PROCmouse
850 MOUSE mxco,myco,mbyt
860 ENDPROC
870 :
880 DEF PROCinitialise
890 PROCAssemble:PROCmouse:*POINTER
900 COLOUR 170 TINT 192:COLOUR 0 TINT
128
910 PROCslab( 0,34,80,30,1):PROCslab(
2,52,66,10,0):PROCslab( 2,47,66, 4,1)
920 PROCslab( 2,36,66,10,0):PROCslab(6
9,54, 9, 8,0):PROCslab(69,44, 9,10,1)
930 PROCslab(69,36, 9, 8,0):PROCslab(
0, 0,80,34,1):PROCslab( 2, 2,76,30,0)
940 PROCcolrmenu(3 ,52,0,0):PROCcolrme
nu(3 ,36,1,0)
950 PRINT TAB(3,7)"<gcol .. tint ...>
colours used for dithering <gcol .. tint
...>"
960 ENDPROC
970 :
980 DEF PROCAssemble
990 DIM codearea 1024
1000 scrnbase=FNscrnbase
1010 FOR pass=0 TO 2 STEP 2
1020 P%=codearea
1030 [ OPT pass
1040 .draw MOV R10,R0
1050 LDR R0 ,colr
1060 LDR R1 ,addr
1070 ORR R0 ,R0 ,R0 ,LSL#&10
1080 MOV R2 ,#&00
1090 MOV R3 ,#&04
1100 .loop1 MOV R4 ,#&40
1110 MOV R5 ,R1
1120 .loop2 ORR R6 ,R2 ,R2 ,LSL#&10
1130 ORR R6 ,R6 ,R0 ,LSL#&08
1140 MOV R7 ,R6
1150 CMP R10,#&00
1160 ORRNE R6 ,R2 ,R2 ,LSL#&08
1170 ORRNE R6 ,R6 ,R6 ,LSL#&10
1180 MOVNE R7 ,R6
1190 MOV R8 ,R5
1200 MOV R9 ,#&08
1210 .loop3 STMIA R8 ,{R6-R7}
1220 MOV R6 ,R6 ,ROR#&08
1230 MOV R7 ,R7 ,ROR#&08
1240 ADD R8 ,R8 ,#&280
1250 SUBS R9 ,R9 ,#&01
1260 BNE loop3
1270 ADD R2 ,R2 ,#&01
1280 ADD R5 ,R5 ,#&08
1290 SUBS R4 ,R4 ,#&01
1300 BNE loop2
1310 ADD R1 ,R1 ,#&1400
1320 SUBS R3 ,R3 ,#&01
1330 BNE loop1
1340 MOV R15,R14
1350 .colr EQU D &00000000
1360 .addr EQU D &00000000
1370 ]
1380 NEXT pass
1390 ENDPROC
1400 :
1410 DEF FNNmbrtext(nmbr,size)
1420 =LEFT$(STR$(nmbr)+" ",size)
1430 :
1440 DEF FNcolrbyte(bytex,bytey)
1450 =?(scrnbase+(bytex DIV 2)+(255-(by
tey DIV 4))*&280)
1460 :
1470 DEF FNscrnbase
1480 codearea!&00=148:codearea!&04=-1
1490 SYS &31,codearea,codearea
1500 !=codearea
1510 :
1520 DEF FNSlabarea(mposx,mposy,mposw,m
posh,mposb)
1530 mposx=mposx*16
1540 mposw=mposx+mposw*16-1
1550 mposy=mposy*16
1560 mposh=mposy+mposh*16-1
1570 IF mposb<>mbyt THEN =FALSE
1580 IF mxco<mposx OR mxco>mposw THEN =
FALSE
1590 IF myco<mposy OR myco>mposh THEN =
FALSE
1600 =TRUE

```



ARC PROCEDURE LIBRARY

Lee Calcraft completes the mouse selection procedures with routines to draw raised selection boxes.

By using the procedures supplied in the last two issues, it is an easy matter to create a customised selection screen for menus or whatever. The two procedures supplied this month can be used to replace PROCdrawgrid from last month so as to generate more stylish selection and display screens.

PROCdrawplinth

The first of this month's additions, PROCdrawplinth, is a direct replacement for PROCdrawgrid. It uses the same arrays to define its shape and position, and requires no alteration to FNgetboxno in order to detect user-selections made on the new block of plinths. The only difference is in the specification of the colours to be used. We now need five different colours to draw the plinths. These are catered for by extending the data arrays from 12 elements to 17.

These five colours are given in order of brightness, the middle colour being the colour of the main face of the plinth, with elements 13 and 14 providing highlights, and 16 and 17 providing shading.

In the accompanying example these have been set up in PROCinitcolours. The plinth-drawing procedure has been written in such a way as to work in both 16 and 256 colour modes without alteration. The example uses mode 12, and we must therefore define some suitable colours. This is performed in PROCinitpalette.

If you append the accompanying procedures to last month's program, and alter

the lines indicated in the table, you will see the new screen display.

```
100 PROCinitialise:PROCinitpalette:
PROCinitcolours
130 PROCdrawplinth(area1(),"Fruits")
140 PROCdrawplinth(area2(),"")
330 DIM area1(17)
340 DIM area2(17)
```

Alter these lines from last month's program.

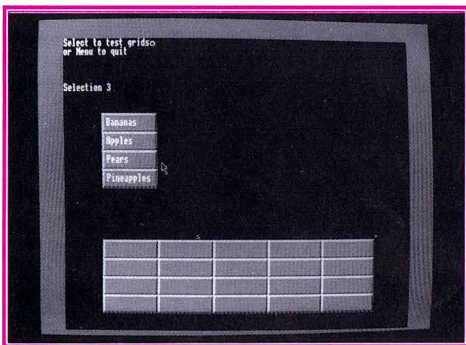
When using 256 colour modes, you will not need to redefine the palette (so the reference to PROCinitpalette in line 100 should be removed) and a special convention is used for specifying colour numbers. Each is made up by adding together the required colour and tint numbers. Thus for example, if you require colour 63 and tint 192 for a particular effect, place the number 63+192 (i.e. 255)

in the appropriate array element.

To try this out in mode 15, delete the reference to PROCinitpalette in line 100, and use the following five colour numbers in PROCinitcolours: 63+192, 62+192, 57+192, 52, 0.

PROCplinth

The main procedure PROCdrawplinth calls PROCplinth, and although you do not need details of this procedure for drawing banks of selection plinths, it is very useful in its



Raised selection boxes in action



own right for drawing raised or sunken plinth objects of any dimension.

It will work in any graphics mode, and takes 11 parameters. The first 4 are the X and Y coordinates of the bottom left-hand corner of the object, and its width and height. The 5th is the depth of the plinth in graphics units. The next 5 parameters are colour numbers, exactly as described above. Finally the flag raised indicates whether the plinth is *raised* (TRUE) or sunken (FALSE).

When designing screens for specific applications, considerable care is needed in selecting sets of colours if good effects are to be achieved. To this end, you may find the Colour Selector in RISC User Volume 2 Issue 2 page 39 particularly useful for the 256-colour modes, while for the 16-colour modes, try the Screen Manager from Volume 1 Issue 5.

The collection of procedures and functions covered so far should make it easy to create sophisticated mouse-controlled selection screens for any program without the headaches implicit in the use of the WIMP. Next month we will be covering new topics.

```
1000 REM >Procs3
1010 :=====
1020 DEFPROCinitcolours
1030 areal%(13)=7
1040 areal%(14)=13
1050 areal%(15)=14
1060 areal%(16)=15
1070 areal%(17)=0
1080 :
1090 area2%(13)=7
1100 area2%(14)=13
1110 area2%(15)=14
1120 area2%(16)=15
1130 area2%(17)=0
1140 ENDPROC
1150 :=====
1160 DEFPROCinitpalette
1170 COLOUR 13,192,192,224
1180 COLOUR 14,148,148,180
1190 COLOUR 15,112,112,148
```

```
1200 ENDPROC
1210 :=====
1220 DEFPROCdrawplinth(a%,text$)
1230 REM Draws set of plinths
1240 LOCAL ix%,iy%,no%
1250 a%(6)=a%(2)*a%(4)
1260 a%(7)=a%(3)*a%(5)
1270 IF a%(0)=-1 THEN a%(0)=(1280-a%(6))
)DIV 2
1280 IF text$<>" THEN PROCrestore(text$):VDU5
1290 FOR iy%=a%(1)+a%(7)-a%(3) TO a%(1)
STEP -a%(3)
1300 FOR ix%=a%(0) TO a%(0)+a%(6)-a%(2)
STEP a%(2)
1310 PROCplinth(ix%,iy%,a%(2),a%(3),8,a%(13),a%(14),a%(15),a%(16),a%(17),TRUE)
1320 IF text$<>" THEN
1330 MOVE ix%+a%(11),iy%+a%(3)-a%(12)
1340 READ text$:GCOL a%(10):PRINTtext$
1350 ENDIF
1360 NEXT
1370 NEXT
1380 IF text$<>" THEN VDU4:OFF
1390 ENDIF
1400 ENDPROC
1410 :=====
1420 DEFPROCplinth(x,y,wx,wy,w,c0,c1,c2,c3,c4,raised)
1430 IF NOT raised THEN SWAP c1,c3
1440 GCOL c1 AND 63 TINT c1
1450 RECTANGLE FILL x,y,wx,wy
1460 GCOL c3 AND 63 TINT c3
1470 RECTANGLE FILL x+w,y,wx-2*w,w
1480 RECTANGLE FILL x+wx-w,y,w,wy-w
1490 MOVE x,y:MOVE x+w,y
1500 PLOT85,x+w,y+w:MOVE x+wx-w,y+wy-w
1510 MOVE x+wx,y+wy-w
1520 PLOT85,x+wx,y+wy:PLOT85,x+wx,y+wy
1530 IF NOT raised THEN SWAP c0,c4
1540 GCOL c0 AND 63 TINT c0
1550 LINE x,y+wy,x+w,y+wy-w
1560 GCOL c4 AND 63 TINT c4
1570 LINE x+wx,y,x+wx-w,y+w
1580 GCOL c2 AND 63 TINT c2
1590 RECTANGLE FILL x+w,y+w,wx-2*w,wy-2*w
1600 ENDPROC
```

ANNOUNCING A MAJOR NEW SOFTWARE RELEASE

Premier

Circle Software are proud to announce a major new software release for the Archimedes. Premier is so new, there is as yet no defined category for it. Is it a word processor? Is it a report generator? Is it a spreadsheet or a data base? Premier fits none of these categories, rather it spans them all. Premier is a major advance in capability from a single program. These are just some of its features -

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Converting Text Files for 1st Word Plus

Doug Morrison presents a utility to ease the transition from View and Wordwise Plus to 1st Word Plus.

When I first bought my Archimedes, almost a year ago, I immediately sent for Computer Concepts' Wordwise Plus upgrade, which was a useful stop-gap until I bought 1st Word Plus. The main problem, however, has been transferring files from Wordwise Plus, as the different data formats and encoding of control characters made the task almost impossible and certainly extremely frustrating.

The program included with this article goes some way to rectifying the problem, and caters not only for Wordwise Plus files but View files as well. A text file is read byte by byte and converted into a format readable by 1st Word Plus. After asking for the file names to use, the program writes standard header information to the new 1st Word Plus file, including a default ruler and other appropriate data. Spaces and new lines are dealt with by a simple check and substitution routine. Tabs are converted to "new line" characters so that they stand out well in a block of text (1st Word plus substitutes the appropriate number of spaces for a tab), and can be easily re-instated with an existing or amended ruler.

One major, and obvious, difference between Wordwise and 1st Word Plus is the inclusion of the 'green' embedded commands in Wordwise files. These are translated where possible (i.e. the print styles: bold, italic, underline and super/subscript); any others are prefaced by ^^^ and surrounded by "new line" characters. This means they stand out in the new file and their intended effect can be replicated by using the 1st Word Plus layout and editing facilities.

Some of Wordwise's embedded commands, particularly those which control print styles, are printer-specific and may need to be altered if your printer is different from mine, a Panasonic KX-P1080 which claims Epson compatibility. The relevant lines in the program have been marked with REMs and all you should need to do is change the strings in quotes after the WHEN statements to suit your own printer's commands. The 1st Word Plus equivalents do

not need changing, as this is done automatically by the relevant printer driver.

For View, rulers are converted into corresponding 1st Word Plus rulers, and Highlight 1 and Highlight 2 are converted to *underline* and *bold* respectively. All other embedded commands in View are treated as for 'green' codes in Wordwise, that is preceded by ^^^.

The resulting file can be read into 1st Word Plus, with many of its characteristics retained. The effects of those which have not been kept are still clearly indicated in the text.

The program sets up a default 1st Word Plus ruler (Pica font, justification off, single line spacing). This, however, can be changed by adjusting the next to last DATA line, where the byte sequence &5D,&30,&30,&31 can be found. &5D marks the end of the ruler, whilst the other three bytes work as follows. The first byte is the print style (&30 = Pica, &31 = Elite, &32 = Condensed and &33 = Expanded). The next byte controls justification (&30 = justification off, &31 = justification on) and the final byte (&31, i.e. ASCII code for 1) controls the line spacing (&32 gives line spacing of 2 etc.). Should you wish to alter the layout of tabs, the &2E/&7F sequence represents the dots and tabs. If required, it is also possible to alter the page layout, the details of which are in the first two DATA lines, as follows:

bytes 0,1	(&1F,&30)	File Start
bytes 2,3	(&36,&36 = 66)	Form Length
bytes 4,5	(&30,&31 = 01)	Top-of-Form Margin
bytes 6,7	(&30,&33 = 03)	Header Margin
bytes 8,9	(&30,&33 = 03)	Footer Margin
bytes 10,11	(&30,&35 = 05)	Bottom-of-Form Margin

Naturally, all these details can be altered in the usual way from 1st Word Plus, but if you always use different settings from the default, then the DATA lines can be adjusted to take care of these.

The program also allows entry of star commands, useful for checking filenames and ensuring that there is sufficient space on a disc.

Converting Text Files for 1st Word Plus

Escape will always take you back to the start of the program. Use the Quit option to exit.

There is still a fair bit to do if you want to convert all your View or Wordwise files for 1st Word plus, but this utility takes much of the slog and frustration out of the task, and can easily be customised to suit your particular requirements.

```

10 REM          >Converter
20 REM Program  View & WW+ to 1WP
30 REM Version  A1.3
40 REM Author   Doug Morrison
50 REM RISC User June 1989
60 REM Program  Subject to copyright
70 :
80 MODE12
90 PROCinit:ON ERROR IF FNerror END
100 REPEAT
110 n%=FNstart
120 IF n%=0 PROCstar
130 IF n%>0 IF FNopenfiles PROCconvert
140 IF n%>=0 PROCcontinue
150 UNTIL n%<0
160 COLOUR 128:COLOUR 7:VDU26,12
170 END
180 :
190 DEF PROCinit
200 DIM name$(3)
210 name$(1)="View":name$(2)="Wordwise"
"
220 LL%=65:REM default line length
230 VDU28,10,5,69,0
240 COLOUR 132:CLS:COLOUR 3
250 PRINTTAB(20,3)"- TEXT CONVERTER -"
260 PRINTTAB(15,5)"Wordwise Plus to 1s
t Word Plus"
270 VDU28,0,31,79,8
280 COLOUR 131:COLOUR 4
290 ENDPROC
300 :
310 DEF FNstart:LOCAL A$:CLS
320 PRINTTAB(6,1)"Please select View (
V), Wordwise (W), System(*) or Quit (Q)"
330 REPEAT A$=GET$:UNTIL INSTR("QVW*",
A$)
340 IF A$="*" THEN =0 ELSE IF A$="Q" T
HEN =-1 ELSE =ASC(A$)-85
350 :
360 DEF PROCstar
370 LOCAL star$:CLS

```

```

380 PRINT"Please enter Operating Syste
m command:"
390 INPUT"*"star$:OSCLI(star$)
400 ENDPROC
410 :
420 DEF FNopenfiles
430 LOCAL A$,byte,count:CLS
440 PRINTTAB(5,1)"Name of ";name$(n%);
" file: ";:INPUT"" infile$
450 PRINTTAB(5,3)"Name of 1st Word Plu
s file: ";:INPUT"" outfile$
460 PRINTTAB(5,5)"Please confirm (Y/N)
";
470 REPEAT:A$=CHR$(GET AND &DF):UNTIL
A$="N" OR A$="Y"
480 IF A$="N" PRINT:=FALSE
490 IF infile$=outfile$ PROCerr(3,infi
le$):=FALSE
500 in=OPENIN(infile$)
510 IF in=0 PROCerr(1,infile$):=FALSE
520 out=OPENIN(outfile$)
530 IF out>0 PROCerr(2,outfile$):CLOSE
#out:IF NOT FNagain=FALSE
540 out=OPENOUT(outfile$)
550 RESTORE
560 FOR count=1 TO 110
570 READ byte:BPUT#out,byte
580 NEXT
590 =TRUE
600 :
610 DEF PROCconvert
620 LOCAL char%,ctl1%,ct2%,hflag%
630 hflag%=FALSE:CLS
640 PRINTTAB(5,1)"Converting ";name$(n
%);" file ";infile$;" to ";outfile$
650 ctl1%=0:ct2%=0
660 REPEAT
670 char%=BGET#in:ctl1%+=1
680 ct2%+=1:IF ct2% MOD100=0 PRINT".";
690 IF char%<33 OR char%>127 THEN PROC
translate ELSE BPUT#out,char%
700 UNTIL EOF#(in)
710 CLOSE#in:CLOSE#out
720 PRINT'TAB(5)"Conversion finished"
730 ENDPROC
740 :
750 DEF PROCtranslate
760 CASE char% OF
770 WHEN &20: IF ctl1%>LL% THEN BPUT#ou
t,&1E:BPUT#out,&0A:ctl1%=0 ELSE BPUT#out,
&1E

```


RISC USER READER SURVEY

We hope you will take this opportunity to express your views about RISC User. These will be vitally important to us in determining the future direction of the magazine and the services provided by BEEBUG. We appreciate that answering the questionnaire will take some thought and time, but we would ask you to answer as many questions as possible. Please return completed questionnaires by 16th June.

Where alternatives are listed, please select the most appropriate response(s). Opportunity is often provided for your own answers. Please use this whenever appropriate. Leave blank any questions you do not wish to answer.

I. PERSONAL DETAILS

1. Age: ☐ under 20 ☐ 20-40 ☐ 41-60 ☐ over 60
2. Occupation:
3. Which Archimedes do you use? ☐ A305 ☐ A310 ☐ A410
 ☐ A420 ☐ A440 ☐ none
4. What are the main uses of your Archimedes:
☐ Hobby/Recreation ☐ Office work at home ☐ Business
☐ Education at home ☐ School/College/University ☐ Home/personal work
☐ Club/Society ☐ Other:
.....
5. What major items of software do you use (or intend to purchase in the next six months):
☐ 1st Word Plus ☐ Logistix ☐ Hearsay
☐ Pipedream ☐ SigmaSheet
☐ Alphabase ☐ Artisan
☐ System Delta (Plus) ☐ ProArtisan
6. What hardware items do you own (or intend to buy within the next six months) - give make and model (if known):
Modem Mono Printer
2nd floppy disc Colour Printer
Hard disc Laser Printer
Digitiser FAX system
Podule
.....

7. Which computer languages do you use or are familiar with?

- ☐ Basic ☐ ARM Assembler ☐ C ☐ Pascal ☐ Forth
☐ Other.....

8. Please assess your technical competence regarding the Archimedes:

- ☐ Beginner ☐ Moderately Competent ☐ Very Competent ☐ Expert

II. RISC USER MAGAZINE

9. What was your main reason for subscribing to RISC User?

.....

10. Have your expectations been satisfied (Yes/No)?.....

If not, why not?.....

11. Do you consider other magazines to offer better value for money (Yes/No)?.....

If so, which magazine(s).....

What is it in other magazines which makes you think this way?

.....

12. From the last three issues of RISC User (April to June 1989), name the six items which you consider to be the most interesting or useful.

.....
.....
.....

13. From the same last three issues name the six items which you consider to be the least interesting or useful.

.....
.....
.....

14. Please rank the following types of article for interest and usefulness on a scale of 1 (lowest) to 5 (highest)

- | | | |
|---|--|---|
| ☐ Beginners' Basic | ☐ Basic Workshop | ☐ Beginners' ARM Assembler |
| ☐ Assembler Workshop | ☐ Product Reviews | ☐ Utilities |
| ☐ Applications | ☐ Graphics | ☐ Sound |
| ☐ Hints & Tips | ☐ Postbag | ☐ Technical Queries |
| ☐ Games | ☐ Competitions | ☐ News |
| ☐ Business Computing | ☐ Educational Computing | ☐ Hardware Projects |
| ☐ Comms | ☐ Other Languages | |

Other (please specify).....

15. Do you have any other comments on the content of RISC User?

.....
.....

16. If you find RISC User program listings difficult to read, do you have any suggestions to improve this?

.....

17. How do you rate the style of presentation of the whole magazine?

☐ Very good ☐ Good ☐ Poor ☐ Very poor

18. What is it about the style of presentation of the magazine you particularly like/dislike?

.....

.....

19. In general do you find the content of the magazine

☐ Too technical ☐ Just right ☐ Not technical enough

III. RISC USER IMAGE

20. Which three of the following words best describe RISC User to you:

☐ friendly	☐ informative	☐ authoritative	☐ condescending
☐ useful	☐ patronising	☐ interesting	☐ difficult
☐ serious	☐ exciting	☐ light	☐ trivial
☐ daunting	☐ boring	☐ instructive	

21. Assuming that the number of articles, reviews etc. remains the same, do you think a change from A5 to A4 format would improve the magazine.

☐ Yes ☐ No ☐ Wouldn't matter

Please elaborate further if you wish.....

.....

22. Would you prefer more tutorial and explanatory articles in the magazine if this meant that long program listings were only available on the magazine disc?

23. If, as well as the magazine, all the articles were available as text files on a separate disc would you be interested in this?

24. Do you believe that the magazine should provide more of a forum for a variety of short contributions from readers, even if this was partly at the expense of more professionally written articles and programs?

.....

.....

25. Would you be prepared to pay a pro-rata higher subscription rate in return for more articles/reviews etc. in the magazine (Yes/No)?
26. What three changes to RISC User would make you more likely to renew your subscription when it comes due.....
.....

IV. MISCELLANEOUS

27. Have you purchased any products as a result of advertisements in RISC User?.....
28. Do you feel that the level of service from our Technical Support Department is sufficient, bearing in mind that it is a free service?
29. Would you like us to offer an additional "priority hotline" service with *guaranteed turnaround time* on queries on the basis of a separate annual subscription?
.....
30. Is the technical advice service a *major* reason for your subscribing to RISC User?.....
31. If you have purchased products from us within the last three months
Were you satisfied with the service?.....
If you were not satisfied what was the reason?
.....
Do we stock all of the products that you require? If not please specify.....
.....
32. When dealing with BEEBUG:
Do you find our staff generally polite and helpful?.....
Are responses to your enquiries dealt with efficiently? If not please specify.....
.....
33. Do you have any comments on RISC User Magazine or BEEBUG as an organisation?
.....
.....
.....
.....
.....

Thank you for taking the time to answer these questions.

```

780 WHEN &09,&0D,&DD: BPUT#out,&0A
790 REM WHEN &0D: BPUT#out,&1E:BPUT#out,&0A
800 WHEN &02: PROCgreencode
810 REM WHEN &02,&07: BPUT#out,&0A:BPUT#out,&94:BPUT#out,&94:BPUT#out,&0A
820 WHEN &81: PROCruler
830 WHEN &1C,&1D: PROChighlight(char%)
840 WHEN &80: PROCembedded
850 ENDCASE
860 ENDPROC
870 :
880 DEF PROCgreencode
890 LOCAL code%,flag%,greenflag%
900 greenflag%=TRUE
910 REPEAT:oc$=""
920 REPEAT:code%=BGET#in
930 IF code%>96 AND code%<132 THEN code%-=32
940 flag%=(code%=&02 OR code%=&07 OR code%=&0D OR EOF#in):IF NOT flag% oc$=oc$+CHR$(code%)
950 UNTIL flag%
960 IF code%<>&02 THEN greenflag%=FALSE
E
970 CASE oc$ OF
980 WHEN "DS": oc$=CHR$&1B+CHR$&81:
REM Bold
990 WHEN "US": oc$=CHR$&1B+CHR$&88:
REM Underline
1000 WHEN "ES83,0":oc$=CHR$&1B+CHR$&90:
REM Superscript
1010 WHEN "ES83,1":oc$=CHR$&1B+CHR$&A0:
REM Subscript
1020 WHEN "ES52": oc$=CHR$&1B+CHR$&84:
REM Italics
1030 WHEN "DE","UE","ES84","ES53":oc$=CHR$&1B+CHR$&80:REM Cancel
1040 OTHERWISE
1050 oc$=CHR$(&0A)+"^^"+oc$+CHR$(&0A)
1060 ENDCASE
1070 FOR ocplace=1 TO LEN(oc$)
1080 BPUT#out,ASC(MID$(oc$,ocplace))
1090 NEXT
1100 UNTIL greenflag%=FALSE
1110 ENDPROC
1120 :
1130 DEF PROCruler
1140 LOCAL code%:LL%=0:PTR#in=PTR#in+2
1150 BPUT#out,&0A:BPUT#out,&1F:BPUT#out,&39:BPUT#out,&5B
1160 REPEAT:code%=BGET#in:LL%=LL%+1
1170 CASE code% OF
1180 WHEN &2A: BPUT#out,&7F
1190 WHEN &0D: BPUT#out,&5D:BPUT#out,&30:BPUT#out,&30:BPUT#out,&31:BPUT#out,&0A
1200 OTHERWISE
1210 IF code%<>&3C AND code%<>&3E BPUT#out,code%
1220 ENDCASE
1230 UNTIL code%=&0D OR EOF#in:ct1%=0:L%=LL%-1
1240 ENDPROC
1250 :
1260 DEF PROChighlight(c%)
1270 BPUT#out,&1B
1280 IF hflag% BPUT#out,&80:hflag%=FALSE ELSE hflag%=TRUE:IF c%=&1C BPUT#out,&8 ELSE IF c%=&1D BPUT#out,&81
1290 ENDPROC
1300 :
1310 DEF PROCembedded
1320 LOCAL code%:BPUT#out,&0A
1330 BPUT#out,&5E:BPUT#out,&5E
1340 REPEAT:code%=BGET#in
1350 IF code%=&1C OR code%=&1D PROChighlight(code%) ELSE IF code%<>&0D BPUT#out,code%
1360 UNTIL code%=&0D OR EOF#in
1370 BPUT#out,&0A:ct1%=0
1380 ENDPROC
1390 :
1400 DEF FNagain
1410 PRINTTAB(5,VPOS+1)"Do you wish to continue (Y/N)?"
1420 REPEAT:A$=CHR$(GET AND &DF):UNTIL A$="N" OR A$="Y"
1430 IF A$="Y" =TRUE ELSE =FALSE
1440 :
1450 DEF PROCerr(n,msg$)
1460 COLOUR 1:PRINT:PRINT
1470 IF n=1 PRINT"File does not exist:"
1480 IF n=2 PRINT"File already exists:"
1490 IF n=3 PRINT"File names same: ";
1500 PRINT msg$:COLOUR 4
1510 ENDPROC
1520 :
1530 DEF PROCcontinue
1540 PRINTTAB(5,VPOS+1)"Press any key t

```

Continued on page 48

TimeWatch

TimeWatch provides the tools to manage appointments, a 'To Do' list of tasks, and jogs the memory for those important birthdays and anniversaries. TimeWatch retains your information in pages - there is a page for each day of the year, for as many years as desired.



Appointments. Appointments for the day are detailed by start time, estimated duration and a descriptive note. All appointments for the day are displayed in time sequence.



Short Notes. Useful for jotting down a quick reminder, or notes of a telephone conversation.



Tasks to do. TimeWatch will help you plan your time and keep track of outstanding work by displaying your details of tasks in one of the categories 'Start Today', 'Ongoing' or 'Overdue!'.



Birthdays, anniversaries etc. Don't forget those things that should not be forgotten. Details entered in this category will appear on the same page for all years.

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TimeWatch can also search for a piece of text in any, or all, of your categories of information; print some, or all, of the information stored in a range of pages; and, by means of the perpetual calendar, move quickly from one page to another.

For those who have made use of the Arthur 1.2 DeskTop Diary, TimeWatch will import the contents of the diary files.

DiscTree



provides comprehensive, and easy to use, facilities to display the directory structure of a disc, search for files and backup files.

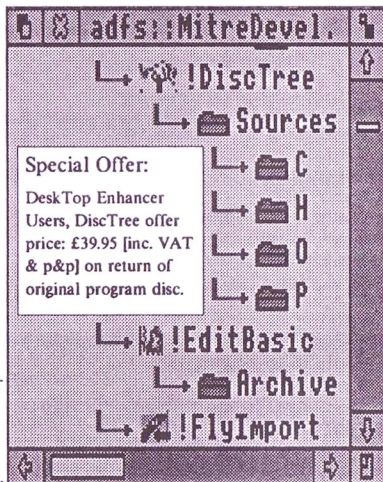
A TreeViewer provides the means to move rapidly around the directory structure of a disc and search for files. After specifying the directories to search, name and type to match the files found will be displayed, ready for loading into an editor.



A backup is performed after specifying the directories to search, file name, type and date to match. These criteria may be saved to a script file for fast and easy repeated use.



Backup copies files matching your criteria to floppy discs. Files are spread over many discs if required. Restore displays the contents of backup discs and allows the restoration of files by dragging to the required destination, or automatic restoration to their original locations.



DiscTree and TimeWatch are written specifically for RISC OS desktop and make full use of the WIMP, multi-tasking and inter application communication.

Prices: DiscTree: £49.95. TimeWatch: £29.95 [inc. VAT and p&p].

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AUTOMATING THE DESKTOP

David Spencer explains how you can customise the RISC OS Desktop.

Think how nice it would be to be start up the Desktop and have all your chosen applications already installed, your most used directories displayed, and the various memory allocations set exactly as you want them. Well, this article will explain how to do just that.

Starting up the Desktop to our own recipe is a two stage process because the memory configuration must be performed before the Desktop is started, and the installation of applications and the opening of directory viewers afterwards.

We will start by tackling the memory configuration problem, and for this we will use the Soft Configuration Utility featured elsewhere in this issue. The first stage is to create an Obey file (using *!Edit*) along the lines of that shown in listing 1. The first line of this is a *QUIT* command to ensure that the *CONFIG* utility will work properly. This is followed by a number of *CONFIG* commands to set up particular memory allocations. The two commands in listing 1 set the Font cache to 80K, and the RAM disc to 128K. For more details refer to the article itself, but note that changing the screen size will have no effect because the Task Manager automatically shrinks it as much as possible when in the Desktop.

The next line in the Obey file starts the Desktop itself, and we will come back to this in a moment. Any subsequent lines will only be executed on leaving the Desktop, and in our example serve only to return to Basic, but they could perform any function, such as using *CONFIG* to reset the memory allocations.

```
Quit
Config 4 80
Config 5 128
Desktop -FILE DeskStart
Basic
```

Listing 1. The Obey file

THE DESKTOP START-UP FILE

Starting up individual applications and opening directory viewers is performed by using a second file, which we shall refer to as

the *Desktop start-up file*. This should be a text file, and can again be created using *!Edit*. An example of such a file is given in listing 2. It is the name of the Desktop start-up file which is specified in the **Desktop* command in the Obey file (see listing 1), and both files must be in the same directory.

```
ADFS::Winnie.$!System
ADFS::Winnie.$!Fonts
ADFS::Winnie.$!Edit ADFS::Winnie.$WP.LetterHead
ADFS::Winnie.$!Dustbin
ADFS::Winnie.$!FormEd
Filer_OpenDir ADFS::Winnie.$
Filer_OpenDir ADFS::Winnie.$WP
Filer_OpenDir ADFS::Winnie.$Library
```

Listing 2. The Desktop start-up file

Listing 2 can be thought of in two parts. The first section (the first four lines) lists the applications which are to be started automatically. The full pathname for each of the applications is used, as explained below. Additionally, you will see that the command to start *!Edit* is followed by a filename. This will cause not only *!Edit* to start up, but also to open the named file as well. You will notice from listing 2 that the first application run is *!System*. This is necessary in order to set up the pathname of a directory which contains various relocatable modules used by some of the applications. To be on the safe side always make *!System* the first application run.

Another point to note is that when the *!Font* application is run, a list of the available fonts is displayed. As this generates screen output, the Window Manager subsequently waits for a key, or mouse button, press before continuing. This can prove annoying when the application is run as part of an automatic startup sequence, and it can be avoided by removing the *Echo* and *Fontcat* commands from the *!Font. !Run file*. Again, this can be done using *!Edit*.

The second part of the Desktop start-up file is the set of commands to open directory viewers. These all take the form:

**Filer_OpenDir <pathname>*

where *pathname* is the full pathname of the

AUTOMATING THE DESKTOP

directory to be opened. Listing 2 gives examples of this.

Having set up both files, your customised Desktop can be started by typing `*<filename>`, where *filename* is the name of the Obey file. When several applications are being installed, the start up process can take several tens of seconds during which time you will see just the Desktop background and the pointer.

It is also possible to double-click on the Obey file from within the Desktop to restart it. There is, however, a problem with this latter method in that if CONFIG is used to enable the RAM filing system when it was previously disabled, or vice versa, then the Desktop will not recognise this and will not add or remove the RAMFS icon from the iconbar.

AUTOMATIC START UP

By naming the Obey file *!Boot*, and setting a Run boot option using `*OPT4 2`, the Desktop

can be made to start complete with all your personal touches each time the machine is auto-booted with Shift Break.

FILE NAMES

When using this technique it is important to be clear about filenames. The above examples assume that the Obey file and the Desktop start-up file are in the current directory, and that the CONFIG utility is in either the current directory or the library. All other filenames (application names, data files and directories) are specified using their full pathnames. The easiest way to find out the pathname of a file or directory is to open the directory viewer containing the object in question and then appending the object's name to the title of the viewer with an interspersing dot. For example, the pathname of a file called '!Edit' in the viewer 'ADFS::Winnie.\$' is 'ADFS::Winnie.\$.!Edit'.

RU

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AN AUTOMATIC CONFIGURE UTILITY

David Spencer takes the blues out of reconfiguring your machine.

This program requires RISC OS

The process of reconfiguring the Arc's memory allocations in order to run a particular program is in general rather convoluted, even if an *auto-configure* type program is used. However, the simple machine code utility given here greatly simplifies the matter by allowing the memory allocations to be reconfigured on a temporary basis. Using this utility, it is not necessary to reset the computer, and the configurations set with *CONFIGURE are restored at the next hard reset.

To use the utility, type in and save the listing given here. Running the program will then save the machine code with the filename 'CONFIG'. The command is used in the form:

*CONFIG <area> [<size>]

where *area* is a number representing the memory area to alter (see table 1), and *size* is the desired size in kilobytes. For example:

*CONFIG 2 160

will result in 160K of screen memory being allocated. If the parameter *size* is omitted then the allocation is restored to its configured setting.

The only restriction to the use of this utility is that it will not work if an application is currently running. This means that the computer must be at the *** prompt, and not, say, in Basic. Perhaps the easiest way to use this utility is to include the CONFIG commands in an Obey file which starts with the command QUIT. After the CONFIG commands the Obey file could run a Basic program if desired.

HOW IT WORKS

The operation of this utility is relatively straightforward. After the numeric parameters have been decoded, repeated calls to SWI "OS_ValidateAddress" are used to find the current size of the area being changed. The necessary change in size is then calculated and the new allocation set using the call SWI "OS_ChangeDynamicArea".

Memory Area	Number
System Heap	0
RMA	1
Screen	2
System Sprites	3
Font Cache	4
RAM Filing System	5

Table 1. Memory Area Numbers

```

10 REM >ConfigSrc
20 REM Program      Soft Reconfigure
30 REM Version      A 1.00
40 REM Author       David Spencer
50 REM RISC User    June 1989
60 REM Program      Subject to Copyright
70 :
80 DIM code 2000
90 FOR pass=0 TO 3 STEP 3
100 P%=code
110 [OPT pass
120 MOV R11,R14:ADR R0,defn:MOV R2,R12
130 MOV R3,#100:SWI "XOS_ReadArgs"
140 MOVVS PC,R11
150 LDR R0,[R12]:BL getno
160 MOV R10,R0:CMP R0,#6:BCC ne
170 .error ADR R0,bad
180 ORRS PC,R11,#1<<28
190 .ne LDR R0,[R12,#4]:CMP R0,#0
200 BNE notd:ADR R0,cmos
210 LDRB R1,[R0,R10]:MOV R0,#161
220 SWI "XOS_Byte"
230 SWI "XOS_ReadMemMapInfo"
240 CMP R10,#4:MOVEQ R2,R2,LSL #12
250 MULNE R2,R0,R2:B find
260 .notd BL getno:MOV R2,R2,LSL #10
270 .find SWI "XOS_ReadMemMapInfo"
280 MOV R8,R0:SUB R9,R8,#1
290 ADD R2,R2,R9:BIC R9,R2,R9
300 ADR R0,start:LDRB R0,[R0,R10]
310 MOV R0,R0,LSL #20:MOV R1,R0
320 .chk SWI "XOS_ValidateAddress"
330 BCS chkd:CMP R10,#2
340 ADDNE R1,R1,R8:SUBEQ R0,R0,R8
350 B chk
360 .chkd SUB R0,R1,R0
370 CMP R0,#0:SUBNE R0,R0,R8
380 SUB R1,R9,R0:MOV R0,R10
390 SWI "XOS_ChangeDynamicArea"
400 MOVVS PC,R11:MOVVS PC,R11
410 :
420 .getno CMP R0,#0:BEQ error
430 LDRB R1,[R0]:CMP R1,#0
440 BNE error:MOV R1,#4:MOV R2,#0
450 .loop LDRB R3,[R0,R1]
460 ORR R2,R3,R2,LSL #8
470 SUBS R1,R1,#1:BNE loop
480 MOV R0,R2:MOV PC,R14
490 :
500 .start EQUB &1C:EQUB &18
510 EQUB &20:EQUB &14:EQUB &1E
520 EQUB &10:ALIGN
530 .defn EQU$ "/E,/E":EQUB 0:ALIGN
540 .cmos EQUB 145:EQUB 146:EQUB 143
550 EQUB 147:EQUB 134:EQUB 144:ALIGN
560 .bad EQU 0
570 EQU$ "Bad memory area":EQUB 0
580 ]NEXT
590 SYS "OS_File",10,"Config",&FFC,,co
de,P%

```


Dabhand User Update

**Archimedes Basic Compiler Version 2 Now Available – Free Demo Disc
OS Guide • BASIC V Guide • Shareware Volume 2 • Software Special Offers**

ABC Version 2 Now Available!

ABC is now being used commercially by software houses around the country to develop their own products. Repton 3 and Presenter 2 are just two examples of what can be done with ABC. Here's what the computer press said about ABC version 1:

"...Excellent Dabs Press product. Buy it!" RISC User

"...I can tell you now, I am very impressed. This is a superb package." Archive

"ABC is a vital part of any programmer's toolbox, it puts compilers on other systems to shame. Unquestionably one of the most impressive pieces of software I have yet seen running on the Archimedes." A&B Computing

ABC2 offers even more and is supplied with a demo disc and full documentation.

New Features of ABC2

- RETURN Parameters
- Multiple exit PROCs/FNs etc
- Double and Extended precision
fp with no loss of speed
- Shared runtime libraries
- Global TYPEing
- Remove FP instructions
- New version 2 manual
- Technical support and backup
- Local Error Handling
- RISC OS Desktop compatible
(Installs on Icon bar)
- Further extended CALL and USR
- Automatic Register labelling
- Optional Command Line operation
- Improved HEAP and STACK directives
- Extra Examples
- Still no royalties to pay on compiled code

Coming Soon: Utilities disc with Profiler, Cross referencer and Library maker plus ABC65 the BBC 6502 code generator. Each supplied with comprehensive manual.

FREE DEMO DISC: To receive your free ABC demo disc which includes a cut-down version of ABC simply send us a sae and we'll do the rest! Benchmarks and specification on request. Free Upgrades – ABC1 users will receive version 2 automatically.

£99.95

Archimedes OS Guide

Do you have RISC OS? Struggling with Arthur? Then you need our Dabhand Guide to the Archimedes Operating System. This users guide explains how the OS works and shows you how to get the very best from it.

The price of the 320 page guide is just **£14.95** or **£21.95** including the programs disc (with over 40 programs) and manual.

**Free Archimedes
Catalogue on Request**

BASIC V: Dabhand Guide

For anybody interested in BBC BASIC then this book is essential reading. Assuming a familiarity with BBC BASIC the various many new components of BASIC V are fully described using example programs throughout.

An essential aid for all Archimedes owners, and including coverage of RISC OS BASIC. Price **£9.95** – 128 pages – available now.

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Archimedes Visuals

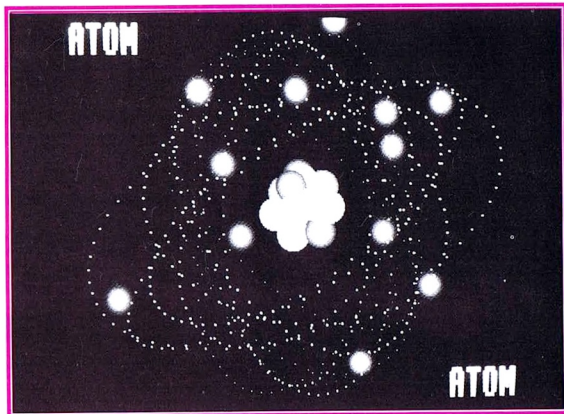
by C. and N. Westley

Carbon Atom Animation

This clever animation displays a carbon atom with its 12 electrons moving around it in elliptical orbits. The electrons are displayed using Exclusive OR sprite plotting, with the effect that they take on an aetherial mantle which highly befits their quantum state.

In addition to the central animation, the authors have used a clever routine (PROC text) to display the word "ATOM" in large text and in a colour which varies with position.

To run the program you will need a screen size of 160K and 8K of sprite space.



Carbon atom display

```
10 REM >Carbon
20 REM Program Carbon Atom
30 REM Version A 0.3
40 REM Authors C & N Westley
50 REM RISC User June 1989
60 REM Program Subject to Copyright
70 :
80 MODE 15
90 PROCinit
100 PROCtext
110 PROCcalc_electrons
120 PROCnucleus
130 PROCanimate
140 END
150 :
160 DEFPROCinit
170 DIM X1(61),Y1(61),X2(61),Y2(61)
180 DIM X3(61),Y3(61),X4(61),Y4(61)
190 DIM X5(61),Y5(61),X6(61),Y6(61)
200 DIM X7(61),Y7(61),X8(61),Y8(61)
210 DIM X9(61),Y9(61),X10(61),Y10(61)
220 DIM X11(61),Y11(61),X12(61),Y12(61)
)
230 OX1=-100:OY1=0:OX2=-100:OY2=0
240 OX3=-100:OY3=0:OX4=-100:OY4=0
250 OX5=-100:OY5=0:OX6=-100:OY6=0
260 OX7=-100:OY7=0:OX8=-100:OY8=0
270 OX9=-100:OY9=0:OX10=-100:OY10=0
280 OX11=-100:OY11=0:OX12=-100:OY12=0
290 ENDPROC
300 :
310 DEFPROCanimate
320 GCOL 3,3
330 REPEAT
340 FOR D=0 TO 59
350 PLOT &ED,OX1,OY1:PLOT &ED,X1(D),Y1
(D):OX1=X1(D):OY1=Y1(D)
360 PLOT &ED,OX2,OY2:PLOT &ED,X2(D),Y2
(D):OX2=X2(D):OY2=Y2(D)
370 PLOT &ED,OX3,OY3:PLOT &ED,X3(D),Y3
(D):OX3=X3(D):OY3=Y3(D)
380 PLOT &ED,OX4,OY4:PLOT &ED,X4(D),Y4
(D):OX4=X4(D):OY4=Y4(D)
390 PLOT &ED,OX5,OY5:PLOT &ED,X5(D),Y5
(D):OX5=X5(D):OY5=Y5(D)
400 PLOT &ED,OX6,OY6:PLOT &ED,X6(D),Y6
(D):OX6=X6(D):OY6=Y6(D)
410 PLOT &ED,OX7,OY7:PLOT &ED,X7(D),Y7
```


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```

(D):OX7=X7(D):OY7=Y7(D)
  420 PLOT &ED,OX8,OY8:PLOT &ED,X8(D),Y8
(D):OX8=X8(D):OY8=Y8(D)
  430 PLOT &ED,OX9,OY9:PLOT &ED,X9(D),Y9
(D):OX9=X9(D):OY9=Y9(D)
  440 PLOT &ED,OX10,OY10:PLOT &ED,X10(D)
,Y10(D):OX10=X10(D):OY10=Y10(D)
  450 PLOT &ED,OX11,OY11:PLOT &ED,X11(D)
,Y11(D):OX11=X11(D):OY11=Y11(D)
  460 PLOT &ED,OX12,OY12:PLOT &ED,X12(D)
,Y12(D):OX12=X12(D):OY12=Y12(D)
  470 NEXT
  480 UNTIL FALSE
  490 :
  500 DEF PROCcalc_electrons
  510 xcentre=620:ycentre=510:A=0:E=44
  520 FOR D=0 TO 59
  530 A+=PI/30
  540 xradius=450:yradius=200
  550 an=RAD(270):X1(D)=FNX:Y1(D)=FNY
  560 xradius=550:yradius=180
  570 an=RAD(35):X2(D)=FNX:Y2(D)=FNY
  580 xradius=420:yradius=280
  590 an=RAD(170):X3(D)=FNX:Y3(D)=FNY
  600 xradius=450:yradius=300
  610 an=RAD(120):X4(D)=FNX:Y4(D)=FNY
  620 xradius=480:yradius=250
  630 an=RAD(100):X5(D)=FNX:Y5(D)=FNY
  640 xradius=400:yradius=250
  650 an=RAD(230):X6(D)=FNX:Y6(D)=FNY
  660 GCOL 78:PLOT 69,X1(D),Y1(D)
  670 GCOL 79:PLOT 69,X2(D),Y2(D)
  680 GCOL 63:PLOT 69,X3(D),Y3(D)
  690 GCOL 3:PLOT 69,X4(D),Y4(D)
  700 GCOL 78:PLOT 69,X5(D),Y5(D)
  710 GCOL 79:PLOT 69,X6(D),Y6(D)
  720 E+=1:IF E=60 E=0
  730 xradius=450:yradius=200
  740 an=RAD(30):X7(E)=FNX:Y7(E)=FNY
  750 xradius=480:yradius=250
  760 an=RAD(75):X8(E)=FNX:Y8(E)=FNY
  770 xradius=400:yradius=190
  780 an=RAD(320):X9(E)=FNX:Y9(E)=FNY
  790 xradius=600:yradius=300
  800 an=RAD(200):X10(E)=FNX:Y10(E)=FNY
  810 xradius=420:yradius=250
  820 an=RAD(130):X11(E)=FNX:Y11(E)=FNY
  830 xradius=450:yradius=270
  840 an=RAD(280):X12(E)=FNX:Y12(E)=FNY
  850 GCOL 63:PLOT 69,X7(E),Y7(E)
  860 GCOL 3:PLOT 69,X8(E),Y8(E)
  870 GCOL 3:PLOT 69,X9(E),Y9(E)
  880 GCOL 79:PLOT 69,X10(E),Y10(E)
  890 GCOL 63:PLOT 69,X11(E),Y11(E)
  900 GCOL 32:PLOT 69,X12(E),Y12(E)
  910 NEXT
  920 ENDPROC
  930 :
  940 DEFFNX=INT((xradius*COS(A))*COS(an)
)-(yradius*SIN(A))*SIN(an)+xcentre)
  950 DEFFNY=INT((xradius*COS(A))*SIN(an)
)+(yradius*SIN(A))*COS(an)+ycentre)
  960 :
  970 DEF PROCnucleus
  980 FOR LOOP=0 TO 11
  990 READ x,y,C
  1000 X=48:T=-64
  1010 FOR L=0 TO 7
  1020 X=-6:T+=64
  1030 IF T=256 THEN C+=&15
  1040 GCOL C TINT T
  1050 CIRCLE FILL x,y,X
  1060 NEXT:NEXT
  1070 MOVE 0,0:MOVE 84,84
  1080 *SET RED
  1090 *SCHOOS RED
  1100 PLOT &EF,0,0
  1110 ENDPROC
  1120 :
  1130 DATA 625,615,4, 584,570,5
  1140 DATA 561,512,9, 609,460,10
  1150 DATA 682,470,4, 707,534,9
  1160 DATA 690,585,5, 635,597,10
  1170 DATA 605,587,4, 613,522,10
  1180 DATA 663,543,9, 42,42,1
  1190 :
  1200 DEF PROCtext
  1210 VDU 5:GCOL 0 TINT 64:MOVE 0,32
  1220 PRINT"ATOM":VDU4:OFF
  1230 FOR X=0 TO 63 STEP 2
  1240 c%=6: t%=-64
  1250 FOR Y=0 TO 32 STEP 4
  1260 IF t%=256 c%+=&15
  1270 GCOL c% TINT t%
  1280 t%+=64
  1290 A=X*3:B=Y*3
  1300 IF TINT(X,Y)>0 THEN RECTANGLE FILL
A,900+B,6,9
  1310 NEXT,
  1320 RECTANGLE 0,900,240,104 TO 1040,0
  1330 ENDPROC

```

USING BASIC'S TOKEN TABLE (Update)

David Spencer gives some more information on the Basic token table.

In the article *Using Basic's Token Table* (RISC User Volume 2 Issue 5), we stated that Basic does not provide a routine to tokenise a Basic keyword. Roger Wilson, author of Basic V, has pointed out that in fact there is such a routine.

The routine in question is called *MATCH*, and it is accessed in a similar way to the *TOKENADDR* routine described in the original article. Lines 30 to 140 of the program below find the address of *MATCH* which is &3833B5C in RISC OS Basic 1.04.

Using *MATCH* is straightforward. The variable B% must point to the location in memory of the text to be tokenised (terminated with a carriage return), and C% to a further block of memory in which to store the result. D% and E% should then be set to zero, and the routine called using CALL match. The string pointed to by A% is not limited to a single token - in fact, this routine can be used to tokenise an entire line. To clarify this, the program below will take a line and tokenise it using *MATCH*. The result is then printed out as a series of hex bytes. Initially, try this routine with just a single keyword.

For more details of the *MATCH* routine refer to pages 234 and 235 of the *Archimedes User Guide*.

```
10 REM > MatchDemo
20 DIM code 1000,in 256,out 256
30 FOR pass=0 TO 2 STEP 2
40 P%=code:[OPT pass
50 LDR R0,[R14,#&48]:TST R0,#&8000000
60 BICQ R0,R0,#&FF000000
70 ORNE R0,R0,#&FF000000
80 ADD R1,R14,#&50
90 ADD R0,R1,R0,LSL #2
100 ADR R1,temp:STR R0,[R1]
110 MOV PC,R14
120 .temp EQU 0:]
130 NEXT:CALL code
140 match=!temp
150 REPEAT
160 INPUT "Enter line " line$
170 $in=line$
180 B%=in:C%=out:D%=0:E%=0
190 CALL match
200 WHILE ?C% <> 13
210 PRINT RIGHT$("0"+STR$~?C%,2); " ";
220 C%+=1:ENDWHILE
230 PRINT'
240 UNTIL FALSE
```

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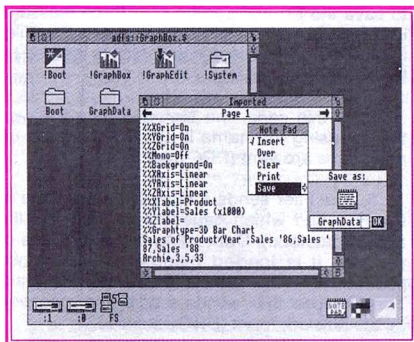
THE RISC USER NOTEPAD (3)

David Spencer concludes this multi-tasking RISC OS application.

This month we add the remaining routines to the Notepad - namely the file transfer and printing options. We will also explain in more detail how specific parts of the program work.

ENTERING THE PROGRAM

The listing given here should be added to the *!RunImage* program from the previous two issues, making sure that the original has not been renumbered in any way. Note that a couple of lines overwrite existing ones. As a check, when the listing has been entered the line numbering should be in increments of ten, with the exception of lines 1710 and 1740 which are not present, and the addition of lines 2525 and 2526. The complete program should be saved back as *!RunImage* in the *!Notepad* directory, and the entire application can then be run from the Desktop.



The Notepad in use

Upon running the Notepad, the changes will not be immediately obvious. However, if you look at the menu option for save you will see that it now offers a submenu. Moving the pointer across to the submenu brings up a filing box like those used by ArcEdit etc. This can be used in exactly the same way as for the other applications. Hence, the name can be edited and the file icon dragged to a directory viewer. Once a notepad is saved, the title of the window changes to reflect the filename, and subsequent

saves can be performed by bringing up the filing box and clicking on *OK* or pressing Return. You will notice that notepad files are identified by an icon representing a page of writing.

Loading a file is even easier. If the Notepad is already installed, then you can pick up a notepad file from a directory viewer and drag it to either the Notepad icon on the iconbar, or into the Notepad window itself. Alternatively, you can just double click on the notepad file. If the Notepad application is not currently installed, then double clicking on a notepad file will install the application and then load the data file. As well as loading notepad files, text files (such as those created using ArcEdit) can also be loaded. In this case, if the file is too long to fit in the eight page notepad then the text is truncated and a warning given. An imported text file is given the name 'Imported', rather than the actual filename.

The entire contents of the notepad can be printed by selecting the *Print* option from the main menu. The eight pages are printed out one after the other with two blank lines between each, except for the fourth and fifth. This ensures that on a printer set to the standard 66 lines per page, then the notepad fits exactly on two sheets.

HOW IT WORKS

Firstly, the print option. This is very straightforward and consists of the last two procedures in the program (lines 4760 onwards). The notepad is printed out on a character by character basis using VDU 1 to ensure that the output is only sent to the printer. The procedure *PROCpr* prints a carriage return, and an optional linefeed which depends on the Ignore character setting. You will notice that the Escape key is re-enabled, because the WIMP normally disables it. A local error handler is used to disable Escape and turn off the printer if an error occurs. As no calls are made to *Wimp_Poll* during the printing, all other tasks will freeze while the notepad is being printed.

The file saving and loading is much more involved. In order to fit into the multi-tasking



environment, all file transfers are performed using a rigidly defined protocol. Fundamental to this is the ability to pass *messages* between tasks, where a message is a variable length block of memory. By defining the contents of the block, a message can be used to provide elaborate inter-task communication.

There is not sufficient space here to explain how messages are used in detail, but a brief explanation should help. A message is sent using the call "Wimp_SendMessage" which specifies who the recipient should be, the address in memory of the block of data making up the message, and a *reason code* which is sent to the recipient. A message can be sent to a particular task, or to the task owning a particular window, or to all active tasks, this latter case being called a *broadcast*. An example of a broadcast is the 'Shut down' message sent by the Task Manager when the user quits the Desktop. A message is received through *Wimp_Poll* by the recipient, with the reason code specified by the sender, and the message block copied into the receiver's parameter block. At the moment, we are only interested in messages with a reason code of 17 or 18 (general messages), in which case the 4-byte word at block!16 (assuming *block* points to *Wimp_Poll*'s parameter block) is a further code or *type*. The procedure *PROCreceive* picks out these types, and there are six we are interested in. The values and meanings of these are:

- 0 Shut down.
- 1 Program wishes to save a file
- 2 Ready to save a file.
- 3 Load a file.
- 4 File has been loaded
- 5 A file has been double-clicked on.

We now need to consider all the possible options for loading and saving. Looking at saving first, the user can do one of two things:

1. Drag the file icon to a directory viewer.
2. Click on OK or press Return within the filing window to save the file using the current filename.

On the loading front, there are three possibilities:

3. The user drags a file icon to the Notepad

window or the Notepad icon on the iconbar.

4. The user double-clicks on a notepad file when the Notepad is already installed.

5. As above, but without the Notepad installed.

We will now explain the steps involved for each of these possibilities. The text in brackets indicates the relevant parts of the program, and the numbers refer to the above list of options.

1. The Notepad initiates the icon drag (lines 1060 - 1220). The WIMP notifies the Notepad when the icon is dropped, and the Notepad then works out the window over which it was dropped, and sends a type one message to that window (PROCsave). This message includes the filename to be used. Assuming it was a directory viewer, the Filer returns a type two message which includes the full pathname under which to save the file. This causes the Notepad to save the file and send a type three message in acknowledgement (PROCdatasave). The Filer returns a type four message which is ignored by the Notepad.

2. In this case, the Notepad simply saves the file using the name it already has, and no messages are sent (PROCquicksave)

3. The Filer sends a type three message to the Notepad which causes it to load the file (PROCdataload). Depending on the file type of the file, it is loaded using one of the two procedures PROCload and PROCtextload. The Notepad then sends a type four message as acknowledgment (PROCackload).

4. The Filer sends a broadcast type five message. The Notepad picks this up, and assuming that the file in question is a notepad file, loads it as if it had been dragged into the notepad. When the type four message is sent back, the Filer takes this as an indication that no further action is needed.

5. In this case, no installed application will recognise the notepad file when it is double-clicked on, and the Filer will then attempt to *RUN the file. The Notepad's !Boot file sets up the alias:



Alias\$@RunType_FEE Run <Obey\$Dir>.!Run %*0

This, in conjunction with the Notepad's *!Run* file and the alias set up to *RUN Basic programs, will ensure that *RUNning a notepad file will result in the command:

*BASIC -quit <Notepad pathname> <File pathname>

where *Notepad pathname* is the full pathname of the Notepad's *!RunImage* file, and *File pathname* is the full pathname of the notepad file which was run. If you don't believe this, try it out.

Lines 80 - 130 of the program pick out any filename supplied when the program is run, and if one is found, line 360 loads the file and opens the notepad window automatically.

The above explanation probably appears very complicated. However, with careful reading and following through the relevant sections of the program, it should begin to make sense.

This ends the RISC User Notepad, though I am sure that in the following months we will feature many more multi-tasking programs, and articles on different aspects of the multi-tasking WIMP system.

```

80 SYS "OS_GetEnv" TO c$
90 p=INSTR(c$, " ", INSTR(c$, " ") + 1)
100 c$=MID$(c$, p + 1)
110 WHILE LEFT$(c$, 1) = " "
120 c$=MID$(c$, 2)
130 ENDWHILE
270 file=FNcreate(0, 0, 268, 164, &8400001
2, 1, 268, 164, 0, st)
310 fsave=FNspriteicon(file, 100, -92, 16
8, -24, &6102, 1, "file_fee")
320 DIM t 2: $t="OK": ok=FNtexticon(file
, 214, -160, 260, -112, &C701913D, t, -1, 3)
330 DIM t 3: $t="A~ ": wr=FNtexticon(fil
e, 4, -160, 210, -112, &700F12D, fi, t, 255)
360 IF c$="" THEN open=FALSE ELSE PROC
load(c$): open=TRUE: PROCretitle(main)
440 WHEN 7: PROCsave
570 WHEN 3, 5: IF b!12=0 THEN PROCdatalog
ad(b)
1060 WHEN file
1070 IF (b!16=fsave) AND (b!8 AND &50)<
>0 THEN
1080 !block=file

```

```

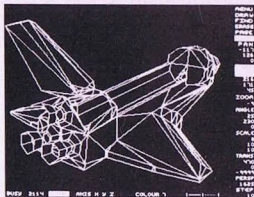
1090 SYS "Wimp_GetWindowState", , block
1100 wex=block!4-block!20
1110 wey=block!16-block!24
1120 block!4=fsave
1130 SYS "Wimp_GetIconState", , block
1140 !block=file: block!4=5
1150 block!8=block!8+wex
1160 block!12=block!12+wey
1170 block!16=block!16+wex
1180 block!20=block!20+wey
1190 block!24=0: block!28=0
1200 block!32=&7FFFFFFF: block!36=&7FFFFF
FFF
1210 SYS "Wimp_DragBox", , block
1220 ENDIF
1230 IF b!16=ok THEN
1240 PROCquicksave
1250 ENDIF
1770 ptr!-20=file
2525 ELSE
2526 IF !b=file AND b!4=wr AND b!24=&D
THEN PROCquicksave
3020 IF data?((maxpage+1)*600-1)=ASC " "
THEN
3770 :
3780 DEF PROCsaveit(name$)
3790 SYS "OS_File", 10, name$, &FEE, , data,
data+600*(maxpage)+1
3800 mod=FALSE: $mt=name$
3810 SYS "Wimp_CreateMenu", , -1
3820 PROCretitle(main)
3830 ENDPROC
3840 :
3850 DEF FNleaf(path$)
3860 WHILE INSTR(path$, ".")
3870 path$=MID$(path$, INSTR(path$, ".")+
1)
3880 ENDWHILE
3890 =path$
3900 :
3910 DEF PROCsave
3920 SYS "Wimp_GetPointerInfo", , block
3930 block!20=64: block!32=0
3940 block!36=1: block!40=block!12
3950 block!44=block!16
3960 block!48=!block
3970 block!52=block!4
3980 block!56=(maxpage+1)*600
3990 block!60=&FEE
4000 $(block+64)=FNleaf($fi)
4010 SYS "Wimp_SendMessage", 17, block+20
, block!12, block!16

```


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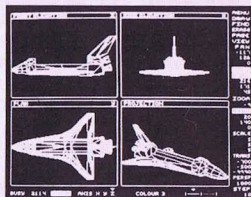
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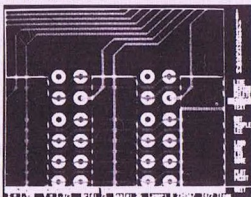
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```
4020 ENDPROC
4030 :
4040 DEF PROCdatasave(b)
4050 PROCsaveit(FNcname(b+44))
4060 $fi=FNcname(b+44)
4070 b!12=b!8:b!16=3:!b=64
4080 SYS "Wimp_SendMessage",17,b,b!20,b
!24
4090 ENDPROC
4100 :
4110 DEF PROCdataload(b)
4120 CASE b!40 OF
4130 WHEN &FEE
4140 PROCload(FNcname(b+44))
4150 PROCackload(b)
4160 WHEN &FFF
4170 PROCtextload(FNcname(b+44))
4180 PROCackload(b)
4190 ENDCASE
4200 ENDPROC
4210 :
4220 DEF PROCload(name$)
4230 SYS "OS_File",&FF,name$,data
4240 $fi=name$: $mt=name$
4250 ENDPROC
4260 :
4270 DEF FNcname(ptr)
4280 f$=""
4290 WHILE ?ptr<>0 AND ?ptr<>13
4300 f$=f$+CHR$?ptr:ptr+=1
4310 ENDWHILE
4320 =f$
4330 :
4340 DEF PROCackload(b)
4350 mod=FALSE:tx=0:ty=0
4360 page=0:$pno="Page 1"
4370 b!12=b!8:b!16=4:!b=64
4380 SYS "Wimp_SendMessage",17,b,b!4
4390 PROCretitle(main)
4400 ENDPROC
4410 :
4420 DEF PROCtextload(name$)
4430 PROCwipe
4440 SYS "OS_Find",&48,name$ TO handle
4450 offset=0:last=0
4460 WHILE offset<(maxpage+1)*600 AND NOT EOF#handle
4470 char=BGET#handle
4480 IF char=13 AND last=10 OR char=10
AND last=13 THEN
4490 last=0
4500 ELSE
4510 last=char
4520 IF char<>10 AND char<>13 THEN
4530 data?offset=char:offset+=1
4540 ELSE
4550 offset=40*((offset+39) DIV 40)
4560 ENDIF
4570 ENDIF
4580 ENDWHILE
4590 IF NOT EOF#handle THEN
4600 $(block+64)="      Text has been truncated"
4610 SYS "Wimp_ReportError",block+64,1,
"Note Pad"
4620 ENDIF
4630 CLOSE #handle
4640 $fi="Imported":$mt="Imported"
4650 ENDPROC
4660 :
4670 DEF PROCquicksave
4680 IF INSTR($fi,".") THEN
4690 PROCsaveit($fi)
4700 ELSE
4710 $block="      To save, drag the icon
to a directory viewer"
4720 SYS "Wimp_ReportError",block,1,"Note Pad"
4730 ENDIF
4740 ENDPROC
4750 :
4760 DEF PROCprint
4770 LOCAL ERROR
4780 ON ERROR LOCAL VDU 3:OSCLI "FX229
1":ENDPROC
4790 VDU 2:*FX 229
4800 FOR sheet=0 TO maxpage
4810 FOR line=0 TO 14
4820 FOR char=0 TO 39
4830 VDU 1,data?(sheet*600+line*40+char
)
4840 NEXT
4850 PROCcr
4860 NEXT
4870 IF sheet<>2 THEN PROCcr:PROCcr
4880 NEXT
4890 VDU 3:*FX 299 1
4900 ENDPROC
4910 :
4920 DEF PROCcr
4930 VDU 1,13
4940 SYS "OS_Byte",246,0,255 TO ,ig
4950 IF ig<>10 THEN VDU 1,10
4960 ENDPROC
```



System Delta Plus Version 2

Reviewed by Stuart A. Bell

System Delta Plus (SD+) was one of the first database packages made available on the Archimedes (see RISC User Volume 1 Issue 3), and in contrast to the plethora of painting, word processing or communications programs, is without a competitor which can boast of facilities such as the ability to handle 2 billion records accessed through a highly intuitive WIMP system. Nevertheless, Minerva has released SD+ Version 2 (SD+V.2), claiming that it offers 'many updated features', at a recommended price of £79.95 inc VAT, an increase of £10.00 on the original version.

Technically, the SD+ package consists of two parts: first a set of commands implemented in ARM machine code which provides facilities to create, access and edit database records, and second a 'front-end' written in Basic which implements the WIMP-driven database package by making appropriate calls to the low-level commands. Minerva produce specialised business applications which are also implemented using the same commands. Since, as far as the user is concerned, the two parts present a unified interface, the distinction will be ignored in this review.

SD+ allows a user to create a highly complex record system based on the familiar 'card-index' model, and then to access it by means of a 'video-recorder' type control panel, allowing scanning and fast movement through the cards. Complex sorting and searching facilities are provided. As a regular and enthusiastic user of Version 1, I was interested to see what Version 2 had to offer.

DOCUMENTATION

Breaking the habit of a lifetime, I read the manual first. Its content is virtually identical to that of the original. However, what reviewers called the 'very ordinary looking text' has been replaced by properly type-set text, with clearer headings, a more logical page-numbering system, and an extra insert which lets the impatient use SD+ on a demonstration file in a

couple of minutes. Apart from a few changes in terminology, and the correction of typographical errors, there are three main changes in the manual, which reflect improvements in the software.

First, SD+V.2 now automatically configures the memory allocation of your machine, even under Arthur, and will re-set it if you remember to exit using the Ctrl-Break key combination. This is a vast improvement on the potentially chaotic situation where a user with a number of applications might have to re-configure his machine on every re-boot.

How important this facility will be under RISC OS, which manages memory more intelligently, I don't know, as Acorn's lethargy in distributing RISC OS meant that SD+V.2 had to be tested under Arthur. Indeed, V.2 clearly pre-dates RISC OS, and the manual admits that 'icons may disappear rather than turning grey' and that performance may be impaired if the user tries to make use of the 'instant drag effect' when moving windows around the screen. As SD+ allows multiple files to be open, and simultaneous operations to be performed on them, the fact that it will not (presumably) multi-task under RISC OS should not be too much of a problem.

The second change is that on a 310 only six files can normally be open at once (and two on a 305), as against eight claimed for V.1. Finally, buried away in the Full search section is the revelation that pseudo-English commands may be used, rather than the pseudo-Basic which V.1 required. For example, we can now use:

?name is Smith

rather than:

@name="Smith".

IN USE

Since the emphasis in V.2 is on improving what V.1 already provided, rather than offering new facilities, I compared the two versions performing identical tasks on the

same data file. The only bad result to report is that the boot time, from pressing Ctrl-Break to seeing the main menu, is increased on my floppy based system from 23 to 28 seconds. Also, the available memory which Basic reports during the boot process was reduced on my 1Mbyte system from 520K to 450K.

However, once up and running, all operations such as scanning a file, searching and sorting, are about 20% faster. Further, the screen updating seemed rather speedier during data input, although such an improvement is difficult to quantify. I found few obvious bugs in V.1, but one that did annoy me - the apparent unwillingness of the 'search criteria' window to scroll to the top of the criteria list - remains in V.2. Similarly, the cryptic nature of some error messages has been carried over into the new release.

The new ability to define 'English-style' criteria when doing a Full Search on a file does indeed work well, and the window also displays the equivalent Basic-like expression so that users can check that they are getting the search criteria which they want. It should be noted that the 'English-style' definitions are limited to simple comparisons, and that more complex expressions on more than one field require the older format. Since the Simple Search facility lets users define fields and relationships using the mouse and a pointer, the real benefit of 'English-style' definition is perhaps not that great.

Otherwise, there are few obvious changes. The concept underlying SD+ is that the user interface should be so intuitive that the user hardly has to think about what he is doing. Thus, if Minerva has changed other aspects of the package, they were so transparent to me, even when repeatedly switching between V.1 and V.2, that I missed them.

CONCLUSIONS

System Delta Plus is an excellent piece of software. As the advertisements suggest, it enables inexperienced users to manage a record system without any programming or

computing expertise. Its file operations are performed very quickly, and the user interface - whilst not being totally true to RISC OS standards - is a joy to drive.

For the advanced user, my wish list for SD+ v.3 would be headed by a 'script-file' facility. This would allow frequently used lists of commands to be saved on a file, so that the computer could be left to do some searches, sorts, and reports, whilst the user did something else (play PacMania when multi-tasking versions of both programs are available?) This would combine the advantages of the interface of SD+ with the programmability of systems like dBASE 3, to produce the ultimate database package. Quite how you put cursor movements into a script file is not too obvious, but it can't be impossible, can it?

Finally, the bad news is that SD+V.2 is, like its predecessor, copy-protected, so that the original master disc must be inserted in the drive every time the system is started, even if a working copy is made. Minerva has made a commercial decision which it is quite entitled to do, but I would never knowingly buy a package which held me hostage to one piece of rotating plastic. Minerva are prepared to supply a second disc copy for about £25, and offer a 'by return' replacement if your master disc fails. For the better-off business user an unprotected version is available for £230 inc. VAT.

With this one proviso, I can strongly recommend SD+V.2. I might quibble that the changes from the original are not significant enough to justify the 'Version 2' razzamatazz, but even at its increased price System Delta Plus represents excellent value.

Product	System Delta Plus Version 2
Supplier	Minerva Software 69 Sidwell Street, Devon EX4 6PH. Tel. (0392) 437756
Price	£79.95 inc. VAT

RU

Converting Text Files for 1st Word Plus (continued from page 31)

```
o continue":A$=GET$
1550 ENDPROC
1560 :
1570 DEF FError
1580 CLOSE#0
1590 IF ERR=17 THEN =FALSE
1600 MODE12:REPORT:PRINT" at line ";ERL
1610 =TRUE
1620 :
1630 DATA &1F,&30,&36,&36,&30,&31
1640 DATA &30,&33,&30,&33,&30,&35
1650 DATA &38,&30,&30,&0A,&1F,&31
1660 DATA &1F,&1F,&0A,&1F,&32,&1F
1670 DATA &23,&1F,&0A,&1F,&46,&30
1680 DATA &31,&31,&30,&30,&33,&30
1690 DATA &0A,&1F,&39,&5B,&2E,&2E
1700 DATA &2E,&2E,&7F,&2E,&2E,&2E
1710 DATA &2E,&7F,&2E,&2E,&2E,&2E
1720 DATA &7F,&2E,&2E,&2E,&2E,&7F
1730 DATA &2E,&2E,&2E,&2E,&7F,&2E
1740 DATA &2E,&2E,&2E,&7F,&2E,&2E
1750 DATA &2E,&2E,&7F,&2E,&2E,&2E
1760 DATA &2E,&7F,&2E,&2E,&2E,&2E
```

```
1770 DATA &7F,&2E,&2E,&2E,&2E,&7F
1780 DATA &2E,&2E,&2E,&2E,&7F,&2E
1790 DATA &2E,&2E,&2E,&7F,&2E,&2E
1800 DATA &2E,&5D,&30,&30,&31,&0A
1810 DATA &1B,&80
```

RU

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A DUMP FOR 24-PIN PRINTERS

Make full use of your 24-pin printer with this multi-tone dump from Colin Murray.

Twenty-four pin printers such as the Epson LQ500 and the NEC P2200 are becoming increasingly more popular among Archimedes owners. Unfortunately though, printer dumps designed for use with conventional 9-pin printers are useless with a 24-pin device, and this includes the built-in *Hardcopy* module. The program presented here corrects this by providing a dump for sixteen colour modes (modes 2, 9 and 12). In order to reproduce the colours as grey scales, sixteen different dot patterns are used. The dump is compatible with the LQ500, the P2200, and most other 24-pin printers.

USING THE PROGRAM

Start by typing in and saving the program given in the listing. When run, the program will catalogue the current disc and ask you to enter the filename of a saved screen, which is then loaded. Pressing space will reduce the picture's colours to a series of grey scales and start the dump, while any other key will return you to the catalogue. It takes about two minutes to dump the entire screen, and Escape can be used to abort the dump at the end of the current line.

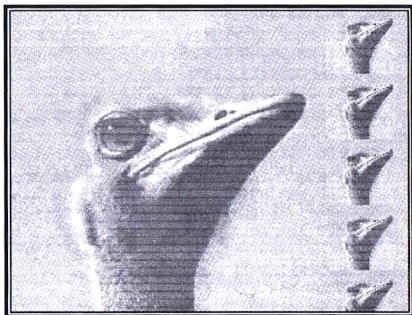
Before dumping the screen, the program has to convert the colours to grey scales. It does this by assuming that colour 0 will be the darkest (i.e. black), and colour 15 will be the lightest (i.e. white). The other colours are assumed to rise in brightness with increasing colour number. You can, if required, change this default mapping by altering the DATA statement in line 600. There are sixteen numbers, one for each logical colour, each of which can take one of sixteen values. These values represent the brightness from 0 (black) up to 15 (white).

To incorporate the dump in your own program, simply include the two procedure definitions (PROCshade and PROCdump), and the two DIM statements from line 80. Then, to produce a dump of the current screen execute PROCdump.

HOW IT WORKS

The dump is performed to a resolution of 320 by 256 screen pixels, with each being

printed as an array of sixteen dots. This means that some resolution is lost in mode 12, but in practice this is hardly noticeable. The printer is set to print 180 dots per inch in both directions, giving a dump size of 7.11" by 5.6" an overall aspect ratio of 1.27:1, which is very close to the screens aspect ratio of 1.33:1.



A mode 12 dump produced by the program

The procedure PROCshade sets up the screen colours, and also the grey scales used by the printer. The data in line 610 defines a four by four print pattern for each grey level. Each hex digit represents one row of the pattern, with the most significant digit being the bottom row. The patterns used are designed to reduce fringe effects when the patterns are printed side by side.

```
10 REM > 24PinPrint
20 REM Program 24-pin printer dump
30 REM Version A1.00
40 REM Author C.W.Murray
50 REM RISC User June 1989
60 REM Program Subject to Copyright
70 :
80 DIM S$(15), grey(15)
90 REPEAT
100 MODE0:*CAT
110 INPUT "Screen filename ";F$
120 OSCLI("SCREENLOAD "+F$)
130 OFF
140 A$=GET$:IF A$=" " THEN PROCdump
150 UNTIL FALSE
160 END
```

A DUMP FOR 24-PIN PRINTERS

```

170 :
180 DEFPROCdump
190 IF MODE <>2 AND MODE <>9 AND MODE
<>12 THEN ERROR 0,"Not a suitable mode"
200 PROCshade
210 *FX200,1
220 VDU2
230 VDU1,27,1,51,1,1,1,10
240 FOR Y%=1020 TO 36 STEP-24
250 VDU 1,27,1,42,1,39,1,0,1,5
260 FOR X%=0 TO1278 STEP 4
270 A%=POINT(X%,Y%)
280 B%=POINT(X%,Y%-4)
290 C%=POINT(X%,Y%-8)
300 D%=POINT(X%,Y%-12)
310 E%=POINT(X%,Y%-16)
320 F%=POINT(X%,Y%-20)
330 FOR CL%=0 TO 3:L%=16^CL%:K%=15*L%
340 BA%=(( (S%(B%)) AND K%)/L%)+(16*((S
%(A%)) AND K%)/L%))
350 BB%=(( (S%(D%)) AND K%)/L%)+(16*((S
%(C%)) AND K%)/L%))
360 BC%=(( (S%(F%)) AND K%)/L%)+(16*((S
%(E%)) AND K%)/L%))
370 VDU1,BA%,1,BB%,1,BC%
380 NEXT: NEXT
390 IF INKEY(-113) THEN VDU1,27,1,64,3

```

```

:OSCLI("FX200,0"):MODE0:PRINT"Escape":0
N:END
400 VDU 1,27,1,74,1,23,1,10
410 NEXT
420 VDU1,12,1,27,1,64,3
430 *FX200,0
440 ENDPROC
450 :
460 DEF PROCshade
470 RESTORE
480 FOR F=0 TO 15
490 READ G:grey(F)=G
500 COLOUR F,G*16,G*16,G*16
510 NEXT
520 FOR N%=0 TO 15
530 READ pattern
540 FOR F%=0 TO 15
550 IF grey(F%)=N% THEN S%(F%)=pattern
560 NEXT
570 NEXT
580 ENDPROC
590 :
600 DATA 0,1,2,3,4,5,6,7,8,9,10,11,12,
13,14,15
610 DATA &FFFF,&FDBE,&FB3F,&DA7A,&5A7A
,&A5A5,&A1A5,&A185,&8185,&8241,&0241,&06
60,&0240,&0600,&0200,&0000

```

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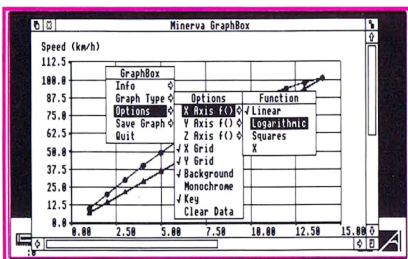




GraphBox

Mike Williams reviews Minerva's fully multi-tasking graph package.

If Minerva's GraphBox is an example of how an application can be transformed by writing it to run under RISC OS in multi-tasking mode, then I cannot wait for more of the same. I reviewed Minerva's GammaPlot in RISC User Volume 1 Issue 9 and found it to be a highly impressive piece of software. GraphBox offers similar (though fewer) facilities, but the ease and convenience of mouse control under RISC OS has to be seen to be believed.



Graphbox showing the Options menu

The software (supplied on a single 3.5" disc) is in two parts, GraphBox itself and GraphEdit. There is also a directory containing 15 demonstration data files. The 36 page manual, with its glossy full colour cover, is well produced, and provides an entirely adequate description of both programs.

From the desktop, open the directory viewer for the GraphBox disc, and double click on the GraphBox icon to open the GraphBox window. Next, open the GraphData directory, and drag any of the demo data files onto the GraphBox window to see the resulting graph displayed. For a better view, resize the window to the whole screen. Now press the *Menu* button, select *Graph Type* and choose any alternative from the list of 20 different forms of graph available, and after a pause the data will be re-displayed in the new format.

Elements of any graph display can be altered by selecting *Options* from the menu. All three axes can be set to linear, logarithmic, square or a function of your choice. In addition, you can control the background grid and various other features. Also from the menu, any graph

can be saved for subsequent printing using an Acorn supplied printer driver, but a graph cannot be printed directly from the screen display.

If you have sufficient memory available you can start GraphEdit while GraphBox is still active. Otherwise you will need to close down GraphBox first. GraphEdit allows data files for subsequent graphing to be created and edited, though GraphBox will accept directly data files in CSV (comma separated value) format from any source.

Activating GraphEdit opens a window for data entry. The first step, using the *Menu* button is to set the number of columns and column headings by using the corresponding menu options. Positioning the mouse pointer over a column and clicking allows data to be entered. An *Options* option allows all the parameters of the eventual graph display to be set up as well.

Once created and edited as required the data can be saved for subsequent loading into GraphBox, or with sufficient memory, GraphBox can be invoked directly to display the graph.

CONCLUSIONS

There are no facilities for displaying more than one graph on the same display, nor can you undertake the detailed and extensive editing of graph displays permitted by GammaPlot. Furthermore, despite the choice of 20 different types of graph, you may still find that there are limitations to the type and scale of graph which you can display, so check your requirements carefully against the specification of GraphBox.

The manual is excellent and does much to enhance the quality feel of the package (fortunately the old style Minerva manuals of which I have been highly critical in the past seem to have disappeared for good). Apart from the few qualifications above, GraphBox is an excellent product and a joy to use.

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Dear RISC User,

I have recently upgraded to the Archimedes from a Master 128. I have a dual 5.25" disc drive which I used with the Master, and I would like to connect this to the Archimedes, though I am not sure what is involved. I notice that BEEBUG sell a Disc Buffer - can you explain what this does, and will I need one?

Martin Featherstone

Any 5.25" disc drive must be fitted externally to the Archimedes, and must include its own power supply (in other words plug directly into the mains). Unfortunately, the disc interface in the Archimedes cannot directly drive the length of cable needed to connect an external drive, and operation of the drive would be unpredictable if this was attempted. Therefore, a *buffer* is needed to boost the signals sent from the Archimedes to the drive, and this is exactly what the BEEBUG unit does. The buffer itself consists of a small circuit board which is easily fitted inside the computer (without the need for a backplane), and which has a socket on the back to connect up to four external drives.

As well as buffering the signals, the BEEBUG buffer performs a number of other functions. In particular, it allows the external drives to be double-stepped so that 40 track discs can be read in 80 track drives, and it also generates certain signals which are needed by the Archimedes but which are not provided by some older disc drives.

Once the external drive is connected, any ADFS format discs from the Master can be read directly. If, however, you want to read DFS format discs you will also need the *BEEBUG DFS Reader* which is a program designed to read files from a DFS disc and transfer them to an Archimedes disc. You can also of course use the 5.25" drive simply as an extra drive for the Archimedes.

For more details of both the *BEEBUG Disc Buffer* and the *DFS Reader* refer to the current retail catalogue.

David Spencer

SAVING AND LOADING FROM MEMORY

Dear RISC User,

In a number of recent programs in RISC User, the word "OSCLI" has been used in a program line which saves or loads a data file. Do I need to use this to load and save blocks of RAM, and if so, how does it work?

Brian Kerr

The use of OSCLI for loading and saving blocks of RAM is certainly convoluted. But fortunately there is a simpler way which makes use of the SYS call "OS_File". This is implemented both on Arthur 1.2 and on RISC OS, and allows variables to be used for filename and addresses where necessary, but avoids the convolutions inherent in the other method.

To load a file use:

```
SYS "OS_File",255,<Filename>,,1
```

The "1" at the end of the call tells the filing system to load the file at its load address.

To load a file at a given address the command is:

```
SYS "OS_File",255,<Filename>,<address>
```

For example:

```
SYS "OS_File",255,name$,buffer%
```

would load the file called *name\$* into RAM at the address held in *buffer%*.

To save a file use:

```
SYS "OS_File",10,<filename>,<filetype>,,<start>,<end>
```

This call additionally sets the file type of the file (for details on file types, see Volume 2 Issue 4 page 42). To give an example, suppose you want to save a block of data held at *buffer%*, and of length *len%* to a file called *MyFile*, and use a file type of *&FFF* (i.e. ASCII data), you could use:

```
SYS "OS_File",10,MyFile,&FFF,,buffer%,buffer%+len%
```

These calls are reasonably easy to use, but you must remember that the call name ("OS_File") is case sensitive ("OS_file" will not do), and be careful with the commas: they are vital.

Lee Calcraff

RU

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Postbag

PASCAL ENTHUSIASTS UNITE

I have an A310 and access to an A440, and I predominantly use Pascal. I also did an assessment of the Pascal compiler for Acorn on the 310.

Your excellent magazine does not cover how to program the machine except in Basic (with some machine code inserts). I would like to contact others like myself who would like to exploit the machine properly, but using Pascal rather than Basic. I have made a start by producing three modules for using the timer, providing random numbers and using the keyboard. To produce a complete set of modules is a big undertaking, especially for more complex facilities such as WIMP extensions.

Brian Wichmann

As Mr Wichmann says, RISC User concentrates on Basic with some ARM assembler, though we do not completely ignore other languages (see our recent review of a Forth compiler in RISC User Volume 2 Issue 4 for example). We would also devote more space in the magazine to other languages if there was sufficient interest. However, as far as Pascal is concerned at present, if anyone wishes to contact Mr Wichmann, they should write to us and we will forward their letters.

WORD PROCESSORS, SPREADSHEETS ETC

Like Mr Weaver in your March issue (Volume 2 Issue 4) I feel that 1st Word Plus is an excellent word processor which caters for all my present needs. I understand that in the ST and PC worlds there is now a 1st Word Plus 2. Can you confirm this?

On the spreadsheet side, I have Pipedream and Logistix, both excellent programs. Pipedream I like for its close links to a word processor, and hence its good presentational ability when printing reports. The reason I use Logistix is for its graphics facilities. But on balance I prefer Pipedream, and if they were to bring out a graph module for it I would use it exclusively.

My problem is when it comes to choosing a good database program. I originally used System Delta Plus

from Minerva, but on upgrading to a hard disc, I found the 'key disc' method of copy protection (see also this month's review of Version 2) was so annoying that I no longer use this program. I have now purchased Alphabase from Clares, and whilst this is not for my purpose as useful as Minerva's System Delta, at least I can use it straight from hard disc. Convenience wins. I am still waiting for the ultimate database, maybe something along the lines of Superbase on the ST which would allow storage of both text and graphical information.

I use an Archimedes at work, and when recommending software it is important that it is not only capable of doing the job, but also that it is convenient to use. No other software we use on other machines is protected in any way. I do know that if the Archimedes is to compete in a business environment, companies like Minerva are going to have to rethink their attitude to copy protection and its effect on the end user.

The answer I received from Minerva when I raised this point just does not wash. I quote, "for £199 plus VAT we can provide a non copy-protected version of System Delta Plus. This is the same sort of price you would have to pay in the business world for a comparable program such as dBase". Is it? When you purchase dBase you not only get the program, but all the things you have to pay extra for with System Delta Plus. That is; programmer's reference manual, reporter module, and mail-shot module. In fact, by the time you have paid for all these Minerva 'extras' the cost of System delta Plus is not far short of £199 anyway.

Simon Coulthurst

We feel that, although longer than most letters which we publish, Mr.Coulthurst's comments were well worthy of a more public airing. What are your views? And maybe the suppliers of some of the software mentioned might like to reply as well. We are also hoping to devote more space to major applications software in future magazines, and indeed have already started to do so in the current issue. Finally, we are not aware of the existence of any version 2 of 1st Word Plus.



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HINTS & TIPS

HINTS & TIPS

This month's collection of hints and tips is rounded up by David Spencer and Lee Calcraff.

A NOVEL USE FOR THE DESKTOP DUSTBIN*

The RISC User *Desktop Dustbin*, featured as a public domain bonus on last month's magazine disc, can be used in a novel way when saving files. How often have you traversed several menu levels to get the save icon, only to find that you haven't got a directory viewer open. Rather than starting all over again, simply drag the file into the dustbin. Then, open the appropriate viewer and the Dustbin, and drag the file back out of the bin.

ASSEMBLER FROM C

Release 2 of the Acorn C compiler allows the object code to be output in the form of an assembler listing rather than an object file. To do this, add the switch `-s` to the command line. You may also find it useful to add the switch `-ff` which will stop function names being included, as these tend to confuse the situation. So, for example, the command:

```
cc testprog
```

would become:

```
cc -s -ff testprog
```

The resulting assembler code is saved with the same name as the source, but in the directory `s`. The listing is in a form suitable for Acorn's OBJASM assembler. The main purpose of this feature is to allow you to 'hand-prune' the code, but it is also interesting to look at how C compiles code.

DESKTOP MOVE*

Normally, when you drag a file from one directory viewer to another in the RISC OS Desktop, the file is copied rather than moved (in other words the original is still intact). On the other hand, if you hold down the Shift key while dragging the file, the original will be deleted after the copy, thereby performing the equivalent of a move.

SERIAL TRANSFERS

Perhaps the quickest way to transfer a file to another computer through the serial port is to use the command:

```
*COPY <filename> Serial:
```

which copies the named file to the serial port. Similarly, a

file can be received using:

```
*COPY Serial: <filename>
```

Obviously the correct baud rate and data format must have been set up using `*CONFIGURE`, or the appropriate `*FX` commands.

CONFIGURE OPTIONS*

Most of the `*CONFIGURE` options which control memory allocation (`SCREENSIZE` etc.) can take the value in kilobytes (by including 'K' after the value) as well as pages on RISC OS. The new form should be used in preference as it is independent of the page size of the memory. For example, the 300 series has an 8K page size, and therefore `*CONFIGURE SCREENSIZE 20` would reserve 160K, while the 400 series has a 32K page size so the same command would reserve 640K. However, `*CONFIGURE SCREENSIZE 160K` would have the same effect on all machines.

MOVED FONTS*

Under Arthur 1.20, any memory reserved for the Font Manager (using `*CONFIGURE FONTSIZE`) was claimed from the relocatable module area (RMA). With RISC OS, the font memory now has its own 'chunk' which starts at logical RAM address `&1E00000`. One effect of this is that whereas font memory could previously be allocated in 4K blocks, it is now reserved in whole pages (8K on 300 series, 32K on 400 series). This does not however affect the values used with `*CONFIGURE FONTSIZE`.

PC PARTITIONS

If you create a partition on a hard disc for the PC Emulator, then this appears to the Archimedes as a large file called 'Drive_C' in the directory 'PC'. You should be very careful not to delete this file, as it would result in all the MS DOS files on drive C being lost. However, don't try to lock the file using `*ACCESS` because this will prevent the Emulator from saving anything on drive C.

CURSOR ON/OFF PROBLEM

As you may be aware, the cursor may be turned on and off from Basic with the two keywords `ON` and `OFF`. To do

HINTS & TIPS

the same from machine code, there are two SWI calls which have a very similar effect:

```
SWI "OS_RemoveCursors"
```

```
and SWI "OS_RestoreCursors"
```

And like all SWI calls, they may be issued from Basic as SYS calls (e.g. SYS "OS_RemoveCursors").

But beware if you are mixing machine code and Basic, because if you turn the cursor off with OFF, the SWI (or SYS) call to restore it will not do the trick, and by the same token, if you turn the cursor off with the SWI call, you cannot use ON to re-instate it.

This leads to the odd situation that the cursor can be doubly turned off by using OFF followed by its SWI equivalent. You will then need to issue both ON and its SWI equivalent before the cursor returns.

SWI NAMES AND NUMBERS

Two SWI calls are provided for converting between SWI numbers and their names:

```
"OS_SWINumberToString"
```

```
and "OS_SWINumberFromString"
```

The program below gives an example of their use. Line 40 places in the variable *numb* the SWI number of "OS_RemoveCursors", while line 70 performs the reverse, taking as an argument the value &36 (the SWI number for "OS_RemoveCursors", and the succeeding line displays the result.

```
10 REM > SwiTest
20 :
30 DIM out &20
40 SYS "OS_SWINumberFromString",,"OS_
RemoveCursors" TO numb
50 PRINT "&";~numb
60 :
70 SYS "OS_SWINumberToString",&36,out
,&20 TO ,swi$
80 PRINT swi$
```

WHICH FORMAT?*

RISC OS provides the user with a new ADFS disc format which avoids the need for periodic disc compacting. The new E format is the default on machines with RISC OS fitted, but is unreadable on machines running under

HINTS & TIPS

Arthur. To find out whether a disc is D or E, or the older L, format, use the command *MAP. On a RISC OS machine this will display the following words:

L format "old map, old directories"

D format "old map, new directories"

E format "new map, new directories"

Under Arthur, the only way to distinguish between L and D formats is to use *FREE and work out the total disc space. This is 640K for L format and 800K for D format. Thanks to Barry Christie for this hint.

SHOWING FILE TYPES*

The command:

```
*Show File$Type*
```

will list the file types currently known to the operating system. This is useful in itself, but you can add your own by using the system variable *File\$Type*. For example, to set up file type &1FF as My Data, use:

```
*Set File$Type_1FF My Data
```

Using *Show should reveal the new file type, and if you use *Info or *FileInfo on a file of this type, you will see the new type displayed in words (up to a maximum of 8 characters).

CASE STRINGS

CASE statements work equally well with numeric OR string variables. You can therefore use statements such as the following:

```
CASE fruit$ OF
  WHEN "bananas":PROCbananas
  WHEN "apples" :PROCapples
  WHEN string$ :PROCvariable
ENDCASE
```

SKIPPING CODE

To skip a piece of code in a program under development, you can simply bracket it with:

```
IF FALSE THEN
.
.
ENDIF
```

This avoids inelegant references to line numbers.

*Hints marked with an * are relevant to RISC OS only.*

RISC User Magazine Disc

June 1989

AN AUTOMATIC CONFIGURE UTILITY - A very useful machine code utility that allows programs to temporarily reconfigure the Arc's memory allocations without having to reset the computer.

THE RISC USER NOTEPAD - The Notepad is completed with the addition of the file transfer and printing routines. The disc contains the complete version.

CONVERTING TEXT FILES FOR 1ST WORD PLUS - A program to convert View and Wordwise format files into a form suitable for 1st Word Plus.

A 24-PIN PRINTER DUMP - A screen dump program for all Epson compatible 24-pin printers.

ANTI-ALIAS FONTS IN 256 COLOURS - A program to demonstrate how the anti-aliased font system can be used in 256-colour modes.

RISC OS SCALED TEXT - A demonstration of the use of a call to plot text at any size.

TOKEN TABLE UPDATE - A short program to illustrate how a routine from Basic can be used to tokenise a program line.

ARCHIMEDES PROCEDURE LIBRARY - The final part of this series contains all the selection box procedures in a complete demonstration program.

ARCHIMEDES VISUALS - A stunning animation of a Carbon atom with electrons that orbit according to the laws of physics.

32000 COLOURS IN MODE 15 - Two programs connected to colour dithering - a simple demonstration of the technique and a colour selector that simplifies the choice of dithered colours.



RASTERBIND	TRIAL	No	SCORE	TOURNAMENT Players Arch Number of Games Total Trials Average per Game Current Leader MESSAGE Solved in 7 tries. Select CONTINUE.
	Arch		Citizen	
	1	1	0 0 0 0 0	
	2	2	0 0 0 0 0	
	3	3	0 0 0 0 0	
	4	4	0 0 0 0 0	
	5	5	0 0 0 0 0	
	6	6	0 0 0 0 0	
	7	7	0 0 0 0 0	
	8	8	0 0 0 0 0	
CONTINUE...				
SOLUTION				

* BONUS ITEMS *

GRAPH BOX EXAMPLES

Some sample graphs produced using Minerva's Graph Box package reviewed in this issue. These are in the form of draw files which can be loaded into the RISC OS Draw application.

RASTERBIND

A code breaker game with a difference - You can either solve the computer's puzzle, or let it solve yours. The game makes good use of the Archimedes' graphics capability.

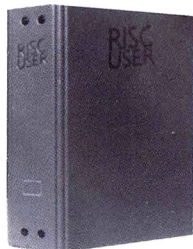
SPHERE CIRCUS

Relax in front of this program which simulates spheres falling and colliding in a viscous medium.

ARCSCAN DATA

Index entries for this issue of RISC User and the latest BEEBUG (Vol.8 No.1) to be used with Arcscan.

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